Registered at the G.P.O., Sydney, for Transmission by Post as a Newspaper. Published Weekly.

THE

MEDICAL JOURNAL OF AUSTRALIA

(With which "The Australasian Medical Gazette," and "The Australian Medical Journal" are incorporated.)

The Journal of the Australian Branches of the British Medical Association

VOL. II.—8TH YEAR.—NO. 6. SYDNEY: SATURDAY, AUGUST 6, 1921. PRICE 1S.

THE MEDICAL JOURNAL OF AUSTRALIA.

VOL. II.—8TH YEAR. SYDNEY: SATURDAY, AUGUST 6, 1921. No. 6.

Table of Contents.

CLINICAL SIGNIFICANCE OF ABSENT HYDROCHLORIC ACID IN THE GASTRIC CONTENTS.[1]

By **John F. Wilkinson, M.D.,**

Honorary Physician, Melbourne Hospital.

In making examinations of gastric contents after a standard test meal in all cases of so-called indigestion presenting symptoms which give no definite lead as to the chemical reactions of the gastric juice, one comes across a considerable percentage which shows deficient or absent HCl, with or without the presence of pepsin ferment, and, as this absence of HCl may be associated with many diverse conditions, I thought it might be of interest to bring before you some of the results of my own clinical experiences in these cases. For practical purposes, deficiency and absence of HCl in the gastric contents must be interpreted as having the same clinical significance.

May I first of all draw attention to my test meal procedure? I usually instruct the patient to have a light breakfast of poached eggs, toast, butter and tea at, say, 8 a.m.. That provides a meal with several easily recognized elements in it, so that if, when drawing off the standard Ewald-Boas meal, there are any remains of the first meal still in the stomach they are easily recognized as pieces of egg, or toast, or fat and thus suggest gastric delay. Then the patient comes along to my rooms and at 1 p.m. (five hours after the first meal) the standard Ewald-Boas meal (90 grammes of stale bread, without crust, and 360 c.cm. of water) is given and the patient is instructed not to take longer than a quarter of an hour in taking it. At 2 p.m. the meal is drawn off by some kind of suction apparatus, either Senoren's or Türck's, and a clean, easily analysed residue is obtained. It is advisable to give no crust with the test meal, as it is liable to cause confusion and be interpreted as toast from the previous breakfast.

I still find that bread or toast and tea is given as the Ewald test meal; but the use of tea is very unsatisfactory, as it renders the colour reaction with di-methyl-diamido-benzol very uncertain. The gastric contents should be tested at once for free HCl, by taking a few drops in a white dish and adding a few drops of 0.5% alcoholic solution of di-methyl-amido-azo-benzol. In the absence of HCl a yellow colour is given, or in the presence of a trace only of HCl a more or less orange tint. This test is simple, rapid and certainly sufficiently accurate for all practical clinical purposes. It has been suggested that there might be in malignant cases sufficient lactic acid present to give a red colour with di-methyl-amido-azo-benzol. All I can say is that I have never met such a case, though I have tested malignant cases containing very large

[1] Read at a Meeting of the Victorian Branch of the British Medical Association on May 4, 1921.

amounts of lactic acid. In malignant disease of the stomach I have never seen sufficient lactic acid to give a red colouration with di-methyl-diamido-benzol and do not believe that the stomach will tolerate lactic acid in sufficient amount to give such a colour reaction.

While talking of the test, may I be permitted to emphasize the absolute necessity in all these cases of testing the digestive capacity of the gastric contents for the presence or absence of pepsin? This, not so much from the point of view of diagnosis, but that of treatment, for, if pepsin is present, there is no need to prescribe it and, if absent, then the patient needs its help, as well as that of the deficient acid, in order to start gastric digestion.

It is a simple matter to take in a test tube two or three centimetres of filtered gastric contents, to add an equal volume of 0.4% HCl and a few strands of fibrin, to place in a water bath at 37° C. and to watch it for half an hour. If the fibrin digests, you can be sure there is peptic ferment present.

What, then, is the value of the test meal? Is it diagnostic? Or is it only of value as an indication for treatment? One often hears the doing of test meals derided, as being of no diagnostic value and therefore quite unnecessary. I have never claimed that test meal work will make your diagnosis in an obscure gastric case, but I do claim that it often makes a very valuable link in the chain of evidence and will sometimes clinch a doubtful diagnosis; that sometimes it actually makes a diagnosis that can be made by no other means and that satisfactory treatment of chronic gastric disorders cannot be carried on without the knowledge gained by test meal work. Hence it is I wish to bring before you to-night some suggestions of clinical significance which have been forced on my notice as a result of this line of investigation.

May I take, first, the subject of chronic gastritis or chronic gastric catarrh? There can be no doubt that such a condition exists as a result of continued irritation of the gastric mucosa by alcohol, pus (from teeth, tonsils, naso-pharynx, etc.), too rapid eating and deficient mastication, etc., where there is excessive secretion of mucus and a change in the chemical contents of the gastric juice. Can any of you tell me what symptoms you would expect to find in such a case, Can you tell me how you can make the diagnosis without doing a test meal? I know the diagnosis is frequently made, for I see many patients who have been told they are suffering from chronic gastritis and, when I inquire into their symptoms, I find nearly all of them complain of pain, affected in some way or other by food. Now, pain is not a symptom of chronic gastritis *per se*. Chronic gastritis is a painless disease and you must look for some other cause of the symptoms if the patient definitely complains of pain. Discomfort after food there will be. but not pain. Over and over again I have seen cases with pain diagnosed as chronic gastritis which were really cases of chronic appendicitis or gall-stones.

You can make the diagnosis in no other way than by giving a test meal and discovering mucus in the recovered gastric contents. It is the presence of mucus that makes the diagnosis, not the presence or absence of HCl. In alcoholics and some excessive meat-eaters there is often excessive HCl associated with the mucus; but, in the majority of cases, HCl will be deficient or absent. Hence, the discovery of absent HCl, together with mucus and usually with pepsin and occasionally with traces of occult or obvious blood, caused by the tube rubbing the velvety mucus membrane, and the absence of anything suggesting any other condition, will enable you to make a diagnosis of chronic gastric catarrh and to treat it as such.

Of course, chronic gastritis may be associated with other conditions, such as gall-stones or chronic appendicitis or cirrhosis of the liver, etc., but there would be other evidences of these and treatment will have to be directed to the causal condition. But, even then, the condition of the stomach cannot be ignored and I maintain that in all these chronic abdominal conditions, before the surgeon performs his little bit of carpentry, the physician should ascertain the condition of the gastric secretions. If this were done systematically and after the operation treatment directed to the stomach were carried out for a few months, we should have fewer failures of operations for so-called appendicitis or gall-stone dyspepsia.

Absent HCl is very common in chronic cholelithiasis and there is very often much mucus secretion in the stomach. These stomachs have to be nursed back to health after the operation and the necessary line of treatment can only be discovered by means of the test meal.

I see many cases of "indigestion" in which an operation has been performed to remove a chronically inflamed appendix and the patients have been told they will be cured now and can eat anything. In the majority of these there is hyperacidity, but occasionally absent HCl is detected. This can only be found out by means of a test meal. In some instances chronic gastritis leads on to complete atrophy of the glands of the gastric mucous membrane—true *achylia gastrica*. In this condition, which supervenes on a long history of indigestion, there is absent HCl, low total acidity and absence of digestive ferments.

There is another class of case in which absence of HCl in the gastric juice is the prime causal factor of the disease. I refer to the so-called gastrogenic diarrhœa. For many years I was puzzled by cases of diarrhœa, in which the patient complained that he awakened early in the morning with the necessity to go to the closet and then, from 2 a.m. or 3 a.m. till breakfast time, had several loose motions and was all right for the rest of the day. I could find no satisfactory treatment for this till I began to find that all these patients showed absent HCl and the treatment suggested by that discovery was the way to cure. Since that discovery I have not seen a case of this type of diarrhœa that has not shown this absence of HCl; but you must do a test meal, for some patients have a chronic gastritis, mucus in the gastric contents, and they will not get well as others do, by merely giving free doses of hydrochloric acid after meals. They need, in addition, either alkaline lavage with the tube or

administration of hot alkaline (*sodæ bicarb.*) drinks before meals and, of course, attention to teeth, tonsils or any other directly infecting focus. I have recently seen a patient with typical gastrogenic diarrhœa who failed to get well under treatment by hydrochloric acid. I found there was a chronic gastritis present and some very septic teeth. The patient soon showed improvement on treatment guided by that discovery.

Some of these conditions are pure neuroses. I think we cannot deny that nervous shock may so inhibit the secretions of the gastric glands as to lead to the disappearance of the hydrochloric acid, with all its consequences. I remember a case of a lady, who, while standing on a railway station, saw a man drop dead. She received a great shock and shortly afterwards developed a typical gastrogenic diarrhœa; I found absence of HCl. But in these nervous cases you will not find any mucus; there is usually a low total acidity, absence of HCl, but presence of ferments. The patients should get well under appropriate treatment, though some of them never recover their HCl secretion and some have to take hydrochloric acid medicinally all their lives in order to secure digestive comfort.

It is probable that in some cases the absence of HCl is congenital. Certainly one sometimes finds it difficult to account for it. But the discovery of the fact must always make you to think seriously.

You know that in pernicious anæmia there is absent HCl and no case is properly treated unless hydrochloric acid is part of the therapy. It has been taught that this is a result of the disease. Personally, I think there is good reason to doubt it. Grawitz has always maintained that the absent HCl is a causal factor in the disease, the absence of the valuable antiseptic properties of the HCl in the stomach leading to a failure to destroy poisons which might otherwise have been innocuous, but which, not being destroyed, lead to the ultimate poisoning of the bone marrow, which causes the clinical entity we label pernicious anæmia.

Many years ago a man in middle life came to my out-patient clinic at the Melbourne Hospital with dyspeptic symptoms. I did a test meal and found absent HCl. He improved on treatment and I lost sight of him. Ten years later he called on me, complaining of great weakness; but he had been in Queensland and was much tanned by the sun and did not look anæmic. I remembered his absent HCl. I noted his weakness, so made a blood examination and found a typical pernicious anæmia.

I saw two cases within three months of men who came, complaining of digestive disturbances; both had absent HCl. In one of them there were symptoms suggestive of gastric neoplasm and, in order to make sure, he agreed to exploration. Nothing was found at operation. Later, both these patients developed a blood picture typical of pernicious anæmia and in both of them the condition of sub-acute combined sclerosis developed before death. I believe that if a blood examination had been made when I first saw these patients I should have detected a sufficient macrocytosis to have put me on the track of the threatened development.

As illustrating that point, a patient was sent to me a few years ago with the diagnosis of indigestion. I found an absent HCl. He also complained of some stinging pains in his tongue—a very significant symptom—and I promptly made a blood examination. There was a very slight reduction in the red count and of the hæmoglobin value, but I found a fair number of large red cells. I told the doctor who sent him to me, much to his surprise, that he was developing pernicious anæmia and, in spite of all treatment, that man died within a year of a typical pernicious anæmia.

It is the knowledge of such cases as this that makes me say that the discovery of absent HCl that cannot be otherwise accounted for, should make us think seriously as to what may be coming and, above all things, we should be on the look out for pernicious anæmia. In such a case the detection of even a few definite macrocytes in the blood is sufficient to justify a provisional diagnosis of pernicious anæmia and to lead us to take the most thorough steps to eliminate all sources of septic absorption into the blood. In this connexion I would like to draw attention specially to the possibility of apical infections of the teeth. I would insist on such a patient having an X-ray photograph taken of all the teeth. There is no other way of discovering the hidden abscess at the apex of a tooth and it may be that hidden abscess that is the source of the poison.

Apart from pernicious anæmia, you will probably find absent HCl in all the severe anæmias and leuchæmias and its administration therapeutically is a very essential part of the treatment.

You are, of course, all aware that gastric neoplasm is usually associated with absent HCl, either because of the chronic gastritis which is set up or in the case of a growth at the pyloric end of the stomach, because of the destruction of the gastric hormone, whose presence is necessary to the secretion of the acid.

While I would not contend that, even in a case in which there are clinical signs suggestive of malignancy, the discovery of absent HCl will clinch the diagnosis, still it is sometimes a very valuable link in the chain of evidence, especially in cases where there has not been much wasting, but only pain of recent origin, some wasting and some weakness.

Recently a fairly stout, florid sea captain came to see me, complaining simply of recent gastric pain, a very slight loss of weight and slight weakness. I found absent HCl and I did not make a diagnosis of gastritis, but sent him at once for skiagraphic examination. He had had no vomiting, but the skiagram showed some delay of food in the stomach and some irregularity about the pylorus. I insisted on an exploratory examination, mainly because of the finding of absence of HCl. The X-ray finding alone was not sufficiently diagnostic, but the skiagram and the absence of HCl left no loophole of escape from the diagnosis; and, as we expected, a pyloric growth was found.

But I have seen cases of wasting, anæmia, vomiting and weakness in elderly persons very suggestive of malignant disease with absent HCl and have seen these patients recover completely with rest in bed,

careful feeding, gastric sedatives and the administration of iron and hydrochloric acid.

The knowledge of the existence of these cases makes diagnosis very difficult sometimes and unless the X-ray examination was very definite in its suggestion or a mass could be felt, I think they should be carefully treated as cases of chronic ulcer and hope should not be given up till they were proved to be undoubtedly malignant.

Exploratory operation in some of these cases is out of the question; the patients are often so feeble that there could be no possible hope of doing a radical removal; but they should not be abandoned to their fate and you may be rewarded by a complete recovery in some of the most unpromising cases.

As an example of this kind of case, let me quote to you that of a lady, Mrs. C., *æt.* 54, whom I saw in April, 1914. For four years she has had some epigastric pain and for the last eight months pain directly after food and very rapidly increasing weakness. Food of any kind made the pain worse and vomiting gave relief. She had lost weight, strength and colour rapidly and was strikingly anæmic. There was nothing to be felt in the abdomen. A test meal revealed absent HCl and X-rays showed definitely delay of food in the stomach; a trace still seen eighteen hours after administration; but there was no definite filling defect. She was far too ill to stand any kind of operation and everybody was afraid she had malignant disease of the stomach. But there was no occult blood in the fæces and, as I say, the X-ray picture was not convincing. I took her into hospital, fed her very carefully, gave her bismuth before food and hydrochloric acid and perchloride of iron after food. She very soon showed signs of improvement and ultimately got perfectly well and has remained well in regard to her digestive system.

In such a case as this it is only by the recognition of the absence of hydrochloric acid that you can hope to get on the right lines for treatment; no case could be more convincing as to the value of test meal work.

Time will not permit me to mention all possible conditions in which HCl may be found absent, but I have simply endeavoured to bring before you some of the conditions and some of the indications that may be the result of the discovery of the fact that free HCl is absent from the gastric contents after a standard test meal and to show how hopeless it is for you to try to treat many conditions with any satisfaction, either to your patient or yourself, in the absence of the indications afforded by a chemical examination of the gastric contents.

ANÆSTHETICS AND THEIR ADMINISTRATION.[1]

By **M. Kasner Moss, M.B., B.S. (Melb.),**
Honorary Assistant Surgeon, Perth Public Hospital.

On the Choice of a General Anæsthetic and the Method of Administering it.

About six years ago I returned to Perth and in common with most general practitioners found a lot of anæsthetic work to be done. My armamentaria at the time were: a chloroform bottle, a Schimmelbusch mask, some lint and a Clover's inhaler. I felt quite sure of my anæsthetist standing and quite pleased with my efforts. I came to a meeting of the Western Australian Branch of the British Medical Association and after listening to a paper on anæsthesia read by Dr. Clement, I got up and in an old, crusty port, conservative sort of way announced to the horrified and edified members that I was a chloroform man, who at times descended to "closed ether" in doubtful cases; in fact, my methods were preferably lethal, but at times only asphyxial! Shortly after, having occasion to remove adenoids, I thought I would like to see the open ether method in action by its exponent. Dr. Clement gave the ethyl chloride-ether sequence by the open method and any anxious moments I had were certainly not due to the anæsthesia. I, being middle aged and impressionable, gave it for him once or twice and so became a renegade to my old chloroform beliefs. As time went on I found patients became cold and pinched through breathing iced ether vapour and just at that time there was published in the *British Medical Journal* a paragraph on warmed anæsthetic vapours. Following the hints and improving on some and abandoning others, after trials and privations I elaborated the apparatus you see to-night. Then, being hopeful, I attempted to make an automatic apparatus, firstly by a blower and later by suction, so that by moving pointers I could give any strength of ether or of chloroform separately or in mixture. But, although by using the inlet valve of a bellows for suction my results were perfect, I found that the patient at times varied his breathing and concentrated vapour resulted. I must have spent well over £100 on various instruments, but at last I abandoned them and returned to my first-born and for long cases in cold weather I rely on it. The foregoing is only historical. All that remains to me is the disappointment and various blowers, containers, boxes and warming elements, an electric motor and a resistance or so.

Practical.

Now as to the choice of an anæsthetic. For short operations, such as opening abscesses, reducing dislocations, or putting a suture or two in a child, I use ethyl chloride, just dropping it on a gauze mask about five layers thick (Bellamy Gardiner's shape). The moment the patient snores, I stop the anæsthetic. It gives 30 seconds or more deep anæsthesia, little or no vomiting and rapid recovery to normal.

For experts operating on adenoids and tonsils, I give ethyl chloride or somnoform (about 3 to 5 c.cm. of the former) by the closed method. A deep anæsthesia is obtained with relaxation and, if the patient has a gag between the teeth before induction, there is ample time to perform the operation, sitting up if preferred, with very little danger.

For dental extractions, curettage, minor surgery, etc., I give ethyl chloride by the drop method on the open ether mask, and when snoring occurs cover over the mask with a towel and through one small uncovered spot soak it with ether. If the ethyl chloride effect wears off rapidly (it does with the locally-made brand), 5 to 10 drops of chloroform on the ether-soaked mask will soothe the patient and a deep anæs-

[1] Read at a Meeting of the Western Australian Branch of the British Medical Association on April 20, 1921.

thesia may be obtained. The longer the time taken over the induction, the greater will be the blood saturation of the patient and the anæsthetic state will be continued longer without replacing the mask. I might remark here that if the patient in a dental operation hold his breath for the first extraction or so, he always seems to stand the whole operation without a second lot of anæsthetic, that is, with a capable extractor.

For major operations, when the patient is well prepared and in warm weather, I generally induce with chloroform very slowly, with the mask well away from the face. As soon as the stage of excitement is over, I use Clover's ether apparatus. By this method there is very little salivation and as the slow part is conducted with chloroform there is little or no cyanosis. I keep the mask to the face till the pointer is at "full" and the patient anæsthetized; then, as a rule, he is allowed one breath of air to four of ether with the pointer at "full."

As alternative methods of induction ethyl chloride by the closed or open method can be used, or a few drops of essence of orange dropped in the bag. This appears to destroy the smell of the ether, but it also destroys the bag! The patient is ready for operation in about 10 minutes; the relaxation is good and the shock is slight.

For long cases where very marked relaxation is necessary I use warmed vapours. At times I induce with ethyl chloride, but as a rule start with warmed chloroform and very gradually increase the ether till the patient is on full ether and chloroform, and then decrease the chloroform. This anæsthetic can be given to the patient in any posture, or by catheter in a tracheotomy tube or down the nose. The induction time is long—about 15 minutes. It is impossible in the excited stage to give a high concentration of chloroform, as rapid pumping only delivers more vapour, if any thing, slightly weaker on account of the lower temperature due to evaporation. The ether can be given in any strength, as the warming element around the containers renders it more volatile. As a rule the moment the dew forms on the container I turn on the warmer and as it begins to disappear I turn it off. By this method the patient breathes quietly but fairly deeply and the colour remains excellent. Good relaxation is obtainable and shock is minimized. I find it takes a considerable amount of ether to saturate a patient and to relax the muscles. There appears to be a time element involved and rapid, deep anæsthesia does not necessarily mean soft abdominal muscles. If the patient be a shallow breather, I cover over the mask with a towel and the rebreathing of CO_2 makes for deep breathing.

For exophthalmic goître I use open or warm ether after a preliminary morphine and atropine injection and a very light anæsthesia after the skin incision.

For obstetrics I use chloroform. I have tried ether, but as these events will occur so frequently at night and in poor houses with only kerosene, I abandoned it. The more so as ether appears to be contra-indicated in kidney cases. Gwathmey's rectal ether-in-oil method has certain definite advantages for nervous patients, where it can be given ostensibly as an enema; in head cases or operation on the upper air passages it is also useful; but in view of the fact that there is a definite increased mortality risk, it cannot be recommended.

In thoracic and throat cases Murphy's intra-tracheal ether method is ideal, but the apparatus is cumbersome and the introduction of the tracheal tube by the direct laryngoscope requires some practice. Still it is perfect, as by it a warmed moistened ether vapour of definite strength is delivered at the correct pressure into the trachea. There is no possibility of asphyxia by blood, etc., blocking the airway and by stopping the ether the lungs can be "washed out" and the ether removed.

For intestinal obstruction with fæcal vomiting local anæsthesia is safest. I have seen at least one patient die on the table from inhaling the regurgitated bowel contents. For patients who on account of weakness or age cannot bear a general anæsthetic, spinal anæsthesia is best, particularly for pelvic or lower extremity operations.

As a child I used always to keep the best to the last. For all cases the best anæsthetic is warmed oxygen and nitrous oxide with a little ether vapour, if necessary, to relax the muscles. It is rapid, safe and sure. There is no post-anæsthetic vomiting and no anæsthetic shock. Its disadvantages are that the apparatus is cumbersome and the material expensive. Also it is not an easy method to learn.

Technical.

Now as regard the method of administration, I will only mention a few points that doubtless all of you know, just as a matter of form. Personally, whenever possible, 15 to 30 minutes before the patient goes on the table, I give the patients 0.0006 grm. of atropine hypodermically. I do this for three reasons: (1) atropine lessens the inhibitory action of the vagus; (2) it lessens salivary secretion; (3) it tends to make respiration machine-like and regular. I try to instil confidence in the patient by conversation and when possible by a cheerful demeanour. I think that the man who gravely examines the heart and looks solemnly down his stethoscope, is liable to make the patient nervous. As a matter of form, I generally rest my ear on the patient's chest and if the heart beat be regular, do not worry about a murmur or audibly suspect the same. I do not believe in bludgeoning off adults with strong, concentrated vapours and find that a few minutes spent with the mask well off the face gains the patient's confidence and materially aids the anæsthesia.

I always desist from attempts to elicit the corneal reflex. Frequently one will see the anæsthetist prize open flickering eyelids and poke an unsympathetic finger into an eye, filled with tears, that gazes up helplessly. I need hardly say that swallowing saliva is another contra-indication to testing reflexes. I nearly always place a towel over the eyelids and only remove it when breathing is regular. It keeps vapour out of the eyes and encourages sleep. If on lifting the eyelid, the eyeball is oscillating, the patient is still far from the brink. I regard as ready a patient with a medium-dilated pupil which when both eyelids are lifted slowly contracts to light. A pin point pupil means sleep or morphine as a rule. A pupil looking down generally means the patient is

not under, particularly if the abdomen is painted with iodine. At least two patients have moved their little finger when deeply anæsthetized, both under the same batch of ether. Whenever I am in doubt as to the anæsthetic stage of the patient, I stop the surgeon and wait. I would implore every young practitioner never to be afraid to do this. Shallow breathing and a dilated pupil are danger signals and watching without super-added traumatic stimuli will decide whether the patient be light and feeling shock or in a state of dangerously deep anæsthesia.

Another point well worth remembering is that the rebreathing of carbon dioxide, even in moderate quantity, produces a dilated pupil, which will almost instantly disappear on breathing air without carbon dioxide.

When the patient is anæsthetized, I nearly always seize his tongue in a clip; it is useful in case of arrest of breathing and it maintains a clear air-way by keeping the tongue forwards. The trauma from the one I show you is practically nil. In testing the light reflex, I always lift up both eyelids simultaneously; this elicits a much more marked reflex than with one eye only.

In regard to the choice of an anæsthetic for a beginner. Ether given by the closed method stands alone. With it, he has a graduated way of regulating his dosage and he can recognize certain stages of anæsthesia corresponding to certain strengths of anæsthetic. He should always remember that in continual rebreathing, the air going backwards and forwards through the ether chamber increases in ether percentage each time it passes over the surface of the ether. The occasional breath of air not only gets rid of carbon dioxide, but also of ether and keeps the percentage down. I use the old narrow bore Clover apparatus (Probyn Williams); I can never get sufficiently deep anæsthesia with Hewitt's wide bore instrument.

At time I have used morphine and atropine for the patient before administering the anæsthetic. I regard it as dangerous before chloroform and confusing before ether, as the light reaction in some patients is entirely lost, so that a patient may be in the danger zone with a pin-point pupil. Morphine also lessens the activity of the respiratory centres.

When a patient stops breathing, I stop the surgeon, lower the patient's head and pull the tongue forward.

I use for artificial respiration rapid pushes over the sternum. Sylvester's method is irrational. The sternal compression method (which Dr. Gray showed me) rapidly ventilates the lungs. It does not strive to imitate natural respiration. It does pump oxygen into the chest with the utmost rapidity. It is not spectacular, but it is effective. Should the heart fail, I have determined to inject either strychnine, pituitrin or atropine directly into the heart muscle, as good results are reported.

I have now finished instructing my grandmother how eggs should really be sucked, but before I "too into the dark descend" I should like to wail on the status of the anæsthetist. The anæsthetist is the Cinderella of the medical profession, but he lacks the fairy godmother to forward his interests or the Prince Charming to espouse his cause. He spends a lot of time and even a little skill in rendering the patient fit for the surgical superman. He may go to a dentist and for 10 minutes' anæsthesia receive a guinea. But when he works for his brother practitioner for one hour's or even two hours' work he receives as a rule two guineas, sometimes for the latter space in a moment of mad extravagance three guineas. A confinement fee is £4 4s. or more for on the average 10 minutes' to 30 minutes' work and a few duty calls. For removal of adenoids the fee is £3 3s. or more for thirty seconds' work. For some unknown reason the anæsthetist, when employed by the man who must know of his worries and difficulties, gets disgracefully paid. At the present price of ether, chloroform, etc., an anæsthetic lasting 1½ hours and paid for at £2 2s., costs from 5% to 10% of the fee! The anæsthetist never gets better paid than the almost useless, though at times ornamental, assistant. On the table an incompetent anæsthetist is more likely to produce a fatality than even a careless surgeon.

THE HEAT LOSSES OF THE BODY CONNECTED WITH SURGICAL OPERATIONS UNDER ETHER ANÆSTHESIA.

By **C. E. Corlette, M.D., Ch.M. (Syd.), D.P.H. (Camb.),**
Surgeon to the Sydney Hospital.

When you can measure what you are speaking about and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely in your thoughts advanced to the stage of science.
—Lord Kelvin.

I am not an anæsthetist, but a surgeon; but, as a surgeon, I am bound to be keenly interested in the subject of anæsthesia. It is a matter of surgical importance. Surgeons cannot afford to leave it alone.

In the following paper I have gone to some considerable trouble in the investigation of some problems of ether anæsthesia from the standpoint of physical chemistry. So far as I have been able to discover, it is the first time that the particular mode of study that I have adopted has been used. I was, in the first place, desirous of clearing up some of the uncertainty that had existed with regard to the subject of the "warmed ether" method of administration. This, I think, I have succeeded in doing. The inquiry has provided, however, a good deal of other information of great value and interest and has extended to a consideration of heat loss from the skin and the methods of counteracting it.

Let us now begin our study. It becomes necessary, right at the beginning, to endeavour to get a broad general picture of the whole thermal phenomena of the body and of the dimensions of its work. We cannot do this without a quantitative study, capable of being expressed numerically, so that we can get a proper idea of the relative importance of the different factors concerned. Fortunately, data exist which will enable us to make approximations to accuracy sufficient to permit of a rational estimation of the value of the more essential factors.

The source of the energy made kinetic in the body is the potential energy stored in the food that is eaten. The food, from this point of view, is a fuel which is burnt up within the body, thereby releasing

its energy. This energy is measured in terms of heat units, of which there are several in use. Ordinarily, the heat unit employed is the small calorie; but there are several slightly different small calories. That most used is the zero calorie, which represents the amount of heat required to raise one gramme of water from 0° C. to 1° C.. A large calorie, or kilo-calorie, is 1,000 small calories. Atwater used the large 20° calorie, which is the amount of heat required to raise 1,000 grammes of water from 19.5° C. to 20.5° C.. However, the differences between the various small or large calories need not trouble us in this inquiry. When a calorie is mentioned in this paper, it must always be taken as referring to the large calorie, unless specially stated to mean a small calorie.

A varying proportion of the energy liberated within the body by the combustion of food disappears as external work done. This can be approximately, but somewhat incompletely, measured and it is conveniently expressed as equivalent calorie units. The rest of the energy escapes as heat and this can be very accurately measured. A great deal of most valuable experimental work of this kind has been carried out in the United States by means of a marvellously ingenious piece of apparatus known as the respiration calorimeter. It is a specially constructed room, in which a man may live and work for days or weeks. It is so accurate and delicate a measurer of energy output that very slight bodily movements, such as rising from a chair or turning over in bed, are immediately registered.

Heat is lost from the body by several paths, of which the two chief are (1) conduction and radiation and (2) evaporation of water from lungs and skin. Some is lost also in warming cold food and drink, some is lost in the urine and fæces and some more by the heat contained in the expired CO_2. Note here that one of the channels of loss by conduction is the heat imparted to the expired air by the warming of the inspired air. The breath figures also as one of the channels of loss by evaporation, for the expired air is moistened as well as warmed.

The normal level of body temperature is adjusted by (*a*) physical and (*b*) chemical means. Physical regulation is attained by controlling the quantity of blood on the surface to modify the amount of heat loss and the function of sweat production may be excited for the same purpose. Chemical regulation comes into play when external cold is causing a heat loss. Consequently, there occurs a suitably adjusted combustion of stored fuel, with evolution of so much heat as may be required to compensate for the loss and for so long as it may be required.

Now let us see what the total output of the human body is under various normal conditions. For this, we can find what we want in a series of metabolism estimations by Atwater and Benedict with the Atwater-Rosa calorimeter.(1)

In 13 "rest" experiments, covering 45 days, the average calorie loss per 24 hours was 2,250. The loss per hour varied from 67.3 during sleep (1 a.m. to 7 a.m.) to 104.6 per hour in the day time. The subjects were not in complete rest, but were very quiet, sitting, writing or reading or lying down. They lived in a properly ventilated atmosphere, kept at 20° C. (68° F.), with a moisture content maintained at a comfortable level. In two "work" experiments, covering 20 days, the subjects worked a stationary bicycle, arranged as an ergometer, for eight hours a day. The work is described as considerably easier than propelling an ordinary bicycle and is regarded as light. The average calorie loss per 24 hours during the "work" experiments was 3,656. The loss per hour varied from an average of 68.2 in the period 1 a.m. to 7 a.m. (sleep) to an average of 217.25 per hour for the 12 hours 7 a.m. to 7 p.m., this period containing eight hours of work and four hours of quiet. This equals 1,344 additional calories in the twelve hours as compared with the output in the "rest" experiments. Obviously, all, or nearly all, of this additional output occurred during the eight hours of work. If we used 105 as the normal output for resting, we should find that the addition during work hours was something near 168 and the total output per hour during work would figure about 273. These 273 calories include the figure per hour for external work measured by the ergometer (29.25). If this were subtracted, the output of the body by other channels would be about 244 calories. As for the channels by which the heat was eliminated, the results per 24 hours in the "rest" experiments were: radiation and conduction of 1,669, urine and fæces 31 and by water vaporized 550. In the "work" experiments the results were: radiation and conduction 2,277, urine and fæces 19 and by water vaporized 1,126; the heat equivalent of the external work measured was 234.

Possibly there have been some calorimetric experiments to determine the amount and channels of heat loss during anæsthesia; but, if so, I am not acquainted with them. I do not propose here to examine the question of heat loss during chloroform anæsthesia. But what about ether? With ether, I should say that, other things being equal, heat loss would vary very greatly with the smoothness and quietude of the anæsthesia; that is to say, with the skill of the anæsthetist, with the apparatus used and with the personal idiosyncrasy of the patient. It seems to me probable also that the amount of heat loss under ether may vary according to whether it has been combined with atropine or not, the reason being already intelligible, though it will become clearer still as we discuss further the causes of loss. The degree of exposure of the patient's body will also make a difference.

There are some constant characteristics of ether anæsthesia that belong to it inherently and not to the method of its administration. Unlike that of typical chloroform anæsthesia, it is associated with much more active respiratory movements, a stronger action of the heart and a fuller skin circulation. So, although we have no calorimetric measurements by which to compare the two, we have, I think, very good grounds for assuming that heat loss is decidedly greater under ether than under chloroform. It is also likely that heat production, from the extra work done by the heart and respiratory muscles, is also greater; but whether this increased heat production does much to balance extra heat loss is another question.

But ether anæsthesia induced and conducted by a

skilled and well-equipped anæsthetist on a good subject is a very different kind of thing from that exhibited by an unskilful administrator on a bad subject. In such circumstances we are often confronted with a picture in many respects resembling that of an individual doing very hard muscular work. The skin is flushed and often excessively engorged; there is a profuse secretion of sweat; the face is livid and bloated, the eyes protruding, the tongue swollen and far too often dragged out by that barbarous instrument—usually the mark of the inexpert—the tongue clip. In addition, the respiration is violent and laboured and the blood nearly black. If a man doing light work in the calorimeter increases his calorie output from a "rest" figure of about 105 per hour to an amount far more than double that figure, what are we to suppose is going on in the etherized patient, who presents most of the external physiological appearances of an organism whose heat losing apparatus is "all out"? One may ask oneself whether the heat loss per hour is likely to be very much less than that shown in the "work" experiments. These experiments exhibit the heat loss that occurred when the atmosphere in the calorimeter was at the comparatively mild temperature of 20° C. (68° F.). One may wonder then what output of calories would be incurred in a really cold atmosphere. And, above all, what would it be if the atmosphere were not merely cold, but blowing a draught?

Let us pause here to consider the effect on heat loss of moving air as compared with still air. Lusk(2) has collected information on this point and he summarizes shortly as follows:

> The effect of wind is such that an imperceptible air current may have a very pronounced effect. Rubner (*Arch. f. Hygiene*, 1904, Bd. L, 196) has shown that wind becomes perceptible when it attains a velocity of 0.4 to 0.5 metre a second and that if a wind much below this threshold value, having a velocity of 0.18 metre per second, act upon the exposed area of the arm, there is increased heat loss of between 19% and 75%, depending on the temperature of the wind, above what would be lost were the air quiet. The effect of wind, of moderate humidity and different temperatures on the metabolism of a man clad in summer clothes, as compared with the metabolism during atmospheric calm, is shown in Wolpert's experiments. According to the results shown in a table made by Wolpert (here quoted by Lusk), a breeze having a temperature of 15° to 20° C. and moving at the rate of about fifteen miles per hour (eight metres per second) has a greater effect upon the metabolism (*i.e.*, the heat production) of a man clad in summer clothing than a temperature of 2° C. would have during perfect atmospheric quiet.

If it is important to diminish heat loss from a patient under operation, the experimental results just quoted place the demand for a still atmosphere in the operating room on a scientific basis. Other reasons exist, but they do not come properly under discussion here.

We can now try to get a right understanding of the kind of warming that is required for an operation room. We have just seen that one of the factors of heat loss under the action of wind is the temperature of the moving atmosphere; the point will become still clearer a little further on, where I show some calculations in which the actual amount of heat in the atmosphere is dealt with. It is quite well known that the warming that is obtained by the use of open fires is mainly and primarily through radiant heat. Radiant heat passes through the atmosphere without appreciably warming it and expends itself in warming up solid bodies that it encounters and only such parts of them as face the source of the rays. Moreover, the open fire produces a rapid current in the atmosphere and that, as we have just seen, is not a warmed atmosphere. The only effectual way of warming up of the air itself is by a source of heat that warms primarily and chiefly by producing convection currents. In other words, we have to employ stoves, hot water coils or steam coils. At the same time, if we adopt these, we succeed in preventing an unduly rapid through current in the atmosphere, while satisfactory ventilation can be easily contrived by quite simple means.

We shall see, however, that it may be desirable, not only to warm and to still, but also to moisten, the atmosphere, as dryness itself is a cause of heat loss. That it acts in this way on the skin surface, by increasing the evaporation of sweat, is so well known as to need no more emphasis; but a dry air also causes increased heat loss by the respiratory channel, through producing a greater evaporation of water from the mucous membrane during breathing. If we know the amount of air respired, the quantity of heat thus lost can be measured, as I shall show later on by figures.

The quantity of heat lost through the skin, therefore, is affected by the temperature, by the degree of humidity and by the mass of air passing over the surface per second. The quantity of heat lost through respiration is affected by exactly the same physical factors. Here, the respiration corresponds to the wind draught and the mucous membrane to the skin. But though the physical factors are the same, the factors of physiological variation are quite different. In the case of the skin, the wind draught is beyond physiological control; but the other physical factors are subject to controlled variations in the fullness of the skin circulation and in the abundance of sweat formation. On the other hand, in respiration the physical condition of the mucous membrane remains a constant factor, while the variation depends on the mass of air which is passed over it per second; that is, on the depth and frequency of the respiratory movements. So here it is the wind draught which is under physiological control. The other physical factors, the temperature and humidity, are only controllable by external means.

The resemblance of the physical conditions of heat loss during ether anæsthesia to those usually associated with muscular work and their intensification in the hands of an unskilful administrator provide, on the one hand, a magnified channel of heat loss through the skin, which is still greater if the atmosphere is moving too fast, and, on the other hand, a magnified channel of heat loss through the breath.

We have now made a general review of the modes and channels of heat loss for the whole body and we have obtained some very important quantitative data as to total calorie expenditure per hour during rest and during light or moderate work.

It now becomes necessary to find out what may be the approximate number of calories lost by the re-

spiratory channel under various circumstances. This does not appear to have been worked out before, so I shall have to work out the problem for myself.

Up to the year 1912 it was believed that the inspired aid was warmed up to body temperature and moistened so as to reach saturation point and then expired at body temperature (37° C.). But it was shown by Galeotti(3) in 1912 that the tension of aqueous vapour in expired air did not correspond with this assumption and would only provide enough moisture to reach about 75% of saturation at a temperature of 37° C.. Loewy and Gerhartz(4) showed in the same year that this was not the true interpretation of Galeotti's data; they arrived at the conclusion that the air was expired at saturation point and at a temperature between 32.5° C. and 33.5° C.. They stated that there is a difference in temperature between air breathed through the nose and air breathed through the mouth, the latter being the warmer. Osborne,(5) of Melbourne, in 1913 arrived at a figure showing a temperature of 33.9° C. for the expired air; but he explains that the conditions were such as would raise the body temperature of the subject of experiment above normal, which would account for a somewhat higher figure for the expired air. The calculations of all workers who wrote before 1913, have been based on the older conception of a saturated atmosphere at 37° C. for expired air, which would introduce an error of about 1% into the figures of moisture content. It is not a great error; but I have thought it best to calculate on the basis of a saturated atmosphere at 33° C..

Therefore, in respiration, the heat added to the inspired air is that required to raise its temperature to 33° C., *plus* the latent heat of vaporization of the added aqueous vapour at 33° C.. The specific heat of dry air is 0.237. In other words, 0.237 of a small calorie is absorbed in raising one gramme of dry air 1° C.. The specific heat of air containing aqueous vapour is a little different, but its consideration need not detain us. The latent heat of vaporization of water varies with its temperature. I have adopted the figure 580 for calculations. This is sufficiently close to the figure 577.7, which is what would be given by interpolation from Callendar's tables. The expression means that at 33° C. it takes 580 small calories to convert one gramme of water into one gramme of vapour.

The difference in the specific heat of expired air caused by the substitution of CO_2 for some of the oxygen can be neglected.

Under ordinary circumstances, the warmth and moisture are imparted to the incoming air mainly in the nasal passages. But during ether anæsthesia, respiration goes on chiefly through the open mouth and the required heat and moisture have to be withdrawn from the mouth and pharynx.

Now, as to the quantity of heat dissipated by respiration. To calculate this, we must know the weight of dry air and of aqueous vapour inspired per unit of time, which we shall make one hour, and we must know its initial temperature.

Data that we can use for this purpose are not plentiful in physiological literature, but I have looked through much of the work recorded, in order to find what is best suited for our requirements, and I have compared the results obtained by various experimental determinations, to see if they are in broad general agreement. I find that, in spite of the scarcity of records, they do tend to support one another. After careful consideration, I think the figures shown by the experiments on Douglas in a paper by Douglas and Haldane(6) are the best adapted to our purpose. To save space, I shall refrain from quoting other results which go to confirm the general typical nature of the figures given; but other figures of the sort are reasonably near. I quote Douglas and Haldane's table below, but to it I have added a column calculated by myself, to show what the respiratory ventilation current would amount to per hour if carried on for that length of time at the same rate. In order to show what figures can be reached during extreme hyperpnœa, I have also added figures reached by Douglas in walking at five miles an hour at the top of Pike's Peak, Colorado, at an elevation of over 14,000 feet above sea level, though I can hardly conceive it possible that such a rate of current could be maintained for a full hour. These last data are from the results of the Pike's Peak expedition, recorded by Douglas, Haldane, Henderson and Schneider.(7) It will be seen that the figures in the table are calculated on the basis of air at 37° C., but the consequent error in the figures is not worth the trouble of correction.

TABLE I..

Conditions.	Litres of Air Breathed per minute at 37° Moist and Prevailing Barometric Pressure.	Respiratory Ventilation Current per hour.	Number of Breaths per minute.	Volume of each Breath in c.cm. at 37° Moist and Prevailing Barometric Pressure.
Rest in bed	7.67	460	16.8	457
Rest, standing	10.4	624	17.1	612
Walking—				
Two miles an hour in laboratory	16.3	978	12.7	1,296
Two miles an hour on grass	18.6	1,116	14.7	1,271
Three miles an hour in laboratory	20.9	1,254	14.9	1,433
Three miles an hour on grass	24.8	1,488	16.2	1,535
Four miles an hour in laboratory	29.0	1,740	14.4	2,010
Four miles an hour on grass	37.3	2,238	18.2	2,064
Four and a half miles an hour in laboratory	34.2	2,052	17.2	2,055
Four and a half miles an hour on grass	46.5	2,790	18.5	2,524
Five miles an hour in laboratory	51.3	3,078	18.3	2,810
Five miles an hour on grass	60.9	3,654	19.5	3,145
Five miles an hour at summit of Pike's Peak	110.2	6,612	35.9	3,085

A study of the table shows a rise from a rate between 400 and 500 litres an hour for rest in bed, upwards to approximately 1,000 litres when walking at two miles an hour, 1,300 to 1,500 for three miles

an hour, 2,000 for four miles, 3,000 and upwards for five miles an hour. Finally, a rate equal to 6,600 litres an hour is reached during strenuous exercise with a low pressure of oxygen, the normal atmospheric condition at high altitudes.

Up to the time of this present study, there had not been recorded any measurements of the respiratory ventilation current of men during ether anæsthesia. In the absence of measurements, it seemed to me likely that in many cases there would be a current more or less approximating to that of a person doing muscular work. I had paid a good deal of attention to the seemingly great respiratory activity of many patients under ether; but impressions are not measurements and are very subject to fallacy. A series of accurate measurements became desirable, if it were at all possible. Here Dr. H. S. Halcro Wardlaw, of the Physiological Department, University of Sydney, offered to collaborate. There were many practical difficulties to consider in connexion with the experimental work and it cannot be doubted that the many difficulties have done much to hinder inquiry heretofore, for the desirability of getting the information must have occurred to many minds. However that may be, Dr. Wardlaw and I have succeeded in devising a suitable method and have succeeded in obtaining measurements which we have good reason to believe are trustworthy. My own share in the practical work has had to be confined to the mere operative surgery, my own patients being the subjects, and without Dr. Wardlaw nothing could have been done. This experimental series was not the cause, but the result of the questions raised since I began the present study. It is tedious and time consuming, subject to much interruption, to individual failures and as yet it is far from completion. When complete, it will be considered as a whole and published. But for the present I have three completed measurements in male patients, which will be enough to go on with. No claim could be made that they represent any average; they are too few for that; and no doubt both lower and higher figures will be recorded in the complete series. But, as far as they go, they give reasonable support to the provisional impression already gained, that the magnitude of the respiratory ventilation current during ether anæsthesia is in many cases increased to a degree comparable with that of a man doing muscular work.

The figures obtained are presented in Table II.:

Table II.—Respiratory Ventilation Current During Ether Anæsthesia in Adult Males.

Patient.	Nature of Operation.	Litres per hour.
J.S.	Laparotomy for pelvic abscess	1,478
H.M.	Hæmorrhoids, cautery	1,183
T.M.	Hæmorrhoids, cautery	1,081

It will be seen that these figures correspond roughly with those of Douglas when walking from two to three miles an hour (see Table I.).

It so happens that my original plan, in the then existing absence of direct experimental determinations of measurement, was to argue from the general resemblance of physical conditions that the respiratory current under ether would bear a correspondence to that accompanying muscular work like that now actually found. I made a number of calculations (presently to be shown), based on a provisional approximation of 1,000 litres (one cubic metre) per hour. Having now some actual quantitative determinations, I could perhaps afford to exclude some of my comparisons with work, in particular those shown in Table I.; but they seem sufficiently interesting in themselves for mere comparison and so I have left them as they stand. The original choice of 1,000 litres was a convenient conventional figure as a basis for calculations. It should still be regarded mainly as a conventional figure, though we have now found that it happens also, for some cases, to be an approximation to the real facts.

I have adopted three temperatures for consideration: (*a*) 33° C., the temperature of expired air; (*b*) 20° C. (68° F.), as a mild temperature, such as that of a warmed operating room in winter; (*c*) 0° C. (32° F.), as representative of a cold atmosphere.

Also, I adopt 0° C. for use as a conventional base line, or zero mark, for expressing the heat contained in dry air, in the same way as the zero mark on a thermometer is used for expressing temperatures. The absolute zero mark of heat is, of course, — 273° C.. The heat belonging to latent heat of vaporization of aqueous vapour depends on the weight of water vapour carried per litre of air and air at 0° C. is still capable of holding a little water. So while conventionally dry air at 0° C. contains no heat, moist air at that temperature contains some heat by reason of its water vapour.

Table III.—Amount of Heat Lost by Expiring 1,000 Litres of Air Saturated With Moisture at 33°, After Having Inspired the Same Weight of Air at Various Specified Temperatures and Water Contents,

Weights in kilograms. Heat in large calories. The calculations are based on meteorological data from Castell-Evans' Physico-Chemical Tables (Table LIX., F.). Figures from the Smithsonian Tables give slightly different results.

1. Hygrometric Condition.	2. Temperature.	3. Weight of Air Inspired.	4. Heat Required to Warm No. 3 to 33°.	5. Weight of Water Present.	6. Heat Required to Warm No. 5 to 33°.	7. Total Heat Required to Warm to 33°.	8. Water Required to Saturate at 33°.	9. Heat Required to Saturate at 33°.	10 Total Heat Required to Warm and Saturate at 33°.
Dry	0°	1.0967	8.60	0.0000	0.00	8.60	0.0353	20.47	29.07
Saturated	0°	1.0967	8.60	0.0044	0.07	8.67	0.309	17.92	26.59
Dry	20°	1.0967	3.39	0.0000	0.00	3.39	0.0353	20.47	23.86
Saturated	20°	1.0967	3.39	0.0159	0.10	3.49	0.0194	11.25	14.74
Dry	33°	1.0967	0.00	0.0000	0.00	0.00	0.0353	20.47	20.47
Saturated	33°	1.0967	0.00	0.0353	0.00	0.00	0.0000	0.00	0.00

(To be continued.)

EXTROVERSION OF THE BLADDER.[1]

The Sequel to Two Cases.

By **Alfred Austin Lendon, M.D. (Lond.),**
Consulting Surgeon, Adelaide Children's Hospital;
and
H. Simpson Newland, C.B.E., D.S.O., M.S. (Ad.), F.R.C.S. (Eng.),
Honorary Surgeon, Adelaide Hospital and Adelaide Children's Hospital.

In the *British Medical Journal* for April 28, 1906, (1) were published some cases of extroversion of the bladder, in which a method of extra-peritoneal implantation of the ureters into the rectum had been adopted. The first operation was performed on May 12, 1899, and the method employed was original so far as we were concerned and indeed has since been termed by Dr. Jaromir Jelinek in his exhaustive pamphlet (2) the "Lendon-Peters operation," the late Dr. Peters, (3) of Toronto, having operated in a precisely similar manner in July, 1899. Dr. J. J. Buchanan, (4) of Pittsburg, however, points out that both Dr. Peters and ourselves were anticipated by Bergenhem (Sweden) in 1896, by Pozza (Italy) in 1897 and by Martin (U.S.A.) and Capello (Italy) in 1898. The operation should therefore properly be known as "Bergenhem's". Both patients having recently died, it was thought that a brief account of their condition during the many years they survived and of the *post mortem* findings in one case might be of interest.

Case No. I..

This patient (Dr. Lendon's) was operated upon on May 12, 1899, and he died on Christmas Eve, 1920, having thus survived over 21 years. The operation was performed when he was a child only 9 years of age and as previous operations for the radical cure of large inguinal herniæ had involved castration, he showed some of the characteristic features of an eunuch, *viz.*, piping alto voice, hairless face and childish countenance. He was broad and stout, his maximum weight was 52 kilograms and his height was 165.75 cm. when aged 23; other members of his family were much taller. He became a barber, a calling for which by temperament he seemed well fitted and he continued to shave and amuse his customers till he was about 28 years of age.

He remained in perfectly good health for quite nine years after the operation (1899-1908) and he could always hold his water in the rectum all through the night. During the next ten years he had occasional bouts of illness, which included rigors, vomiting, pains in the loins and groins and occasionally diarrhœa. The attacks were naturally attributed to uretero-pyelo-nephritis and in confirmation of this idea there was at times some tenderness on palpating the right kidney.

About Christmas, 1918, his legs began to swell. The following January he contracted influenza. From that time forth he began to go down hill. In March, 1919, he got relief from multiple incisions into the dropsical limbs and this treatment was repeated on three occasions. There was never any fluid found in the belly, but the right forearm towards the end was swollen and when ill he was troubled with vomiting, but there were no other corroborative indications of uræmia.

He encountered a severe heat wave in December, 1920, and died on Christmas Eve. A very complete autopsy was performed by Dr. C. T. Turner, the urinary apparatus, together with the lower bowel, being removed *en bloc* and the whole pelvis extracted.

Post-Mortem Examination.

The only traces of the genital organs remaining were remnants of the crura of the penis. The bladder was replaced by scar tissue behind which was some peri-vesical fat and the fibrous structures which constituted a strong ligament between the separated halves of the pubes. (This has been well described by Professor Watson in one of our cases previously reported.) (5) The left kidney with its ureter was embedded all the way down in a dense mass of hard fat; it was a little difficult to find the kidney and very difficult to trace the ureter. The kidney itself was much shrunken, tough, with wasted cortex (1 mm.) and dilated calyces filled with greenish-grey putty-like material. The ureter was 21 cm. in length and of varying calibre—the upper fifth the size of a slate pencil, the middle portion that of a lead pencil, whilst the lower end was strictured and kinked, becoming dilated again at its entry into the rectum on the left antero-lateral aspect, 5.5 cm. above the anal margin. Its site was easily found in the rectum by a small polypoid projection.

The right kidney was a complete contrast. Its capsule peeled readily and its cortex measured 4 mm.. There was some dilatation of the calyces, which were filled with semi-purulent material having the characteristic odour of the *Bacillus coli communis*. The right ureter was slightly dilated throughout the whole of its course and measured 6 mm. in diameter where it opened into the rectum, 8 cm. above the anus, where its gaping orifice admitted a No. 9 catheter.

Notes on the Pelvis, by Professor Wood-Jones.

The pelvis (No. I.) is rearticulated after maceration. The sacro-sciatic notch may be described as ultra-masculine in type. The first three sacral elements remain ununited and all epiphysial lines are distinct. The epiphyses for the iliac crests and for the tuberosities of the ischia are separate. The backward rotation of the ilia is not nearly so well marked as in pelvis No. II. (that of a girl aged 8), but the ilia are still more markedly upright. The sacrum is flattened from side to side and from above downward, but the loss of curvature is not nearly so marked as in pelvis No. II.. Three sacral elements articulate with the ilia, but the first element has been almost completely liberated from the articulation; the first coccygeal element has undergone sacralization. As in pelvis No. II., there are joints between the laminæ of the first two sacral vertebræ; the posterior arches of these two vertebræ are incomplete. The upper articular facets of the first sacral element are of the normal sacral type. The ischio-pubic ramus is slender, and the large obturator foramen is almost vertical in its long axis. The pubic diastasis measures (in the re-articulated specimen) 31 mm.. The distance from the anterior margin of the acetabulum to the free margin of the *os pubis* is equal to the diameter of the acetabulum.

The upward displacement of the sacrum relative

[1] Read at a Meeting of the South Australian Branch of the British Medical Association on March 31, 1921.

to the pelvis has been noted in other specimens by Ballantyne. It is a very remarkable anomaly difficult to associate with the primary malformation. In pelvis No. II. it has led only to an abnormally high position of the sacrum and to the assumption of some definitely lumbar characteristics by the first sacral element. In this case it has led to the almost complete liberation of this bone.

Although the general deformity consists in a splaying apart of the two ilia, it is noteworthy that the pubic diastasis is exaggerated in both specimens by an absolute shortening of the pubis. Whereas in this specimen the horizontal ramus of the *os pubis* measures 63 mm., in a normal male bone of very similar general dimensions it measures 76 mm..

Associated anomalies consist in (*a*) general flattenof the sacrum, (*b*) peculiar slenderness of the ischiopubic ramus, (*c*) general uprightness of the whole of the *ossa innominata*.

Case No. II..

This patient had been under Dr. Newland's care. Apart from an attack of measles in 1914, he remained in good health from the date of the operation in 1904 up to the time of his final illness in 1920. He worked on the family farm and during his brother's absence on active service he managed it. In September, 1920, he weighed 63.5 kilograms, the heaviest he had ever been.

In October, 1920, he consulted Dr. L. G. Muirhead, of Henley Beach. He complained of general weakness, abdominal pain and some cough without hæmoptysis. No pulmonary or laryngeal condition could be detected. He had complete control over his urine and could pass it irrespective of the act of defæcation. The urine on examination was found to be turbid and contained a good deal of albumin. The kidneys were neither tender nor enlarged.

On his return to the country, he consulted Dr. G. H. B. Black, of Snowtown, and was admitted to hospital on November 23, 1920, complaining of weakness, wasting and occasional slight pain below the left costal margin.

He had suffered from indigestion for several months and from a cough for several weeks. He stated that occasionally he had difficulty for a day or so in holding the urine in the rectum for any length of time, but as a rule there was no incontinence.

On examination he was seen to be very wasted. The heart and vessels were natural. Slight pleural friction could be detected at the posterior base of the left lung. The kidneys were neither palpable nor tender.

The healed scar of the old operation was present in the pubic region. It was partly covered with pubic hair. The penis was rudimentary. There was little hair on the face and the voice was falsetto.

A filtered specimen of urine was free from sugar. On December 2, doubtful signs were detected at the apex of the right lung. On December 10, there were signs of a cavity in the same situation and tubercle bacilli were found in the sputum.

A week later, signs of consolidation developed in the lower lobe of the left lung. His general condition now deteriorated rapidly and after an attack of "convulsions," he died on January 15, 1921.

An autopsy was not performed and therefore no report on the condition of the kidneys is possible.

Remarks.

The principal object of this paper is to encourage surgeons who may encounter these rare cases in future, to operate upon the lines laid down in the communication referred to above, (1) for, if a child of 9, whose left ureter was noticed to be much thickened at the time of operation, can survive in comfort for about 20 years and follow his occupation for 18 years till disabled by cardiac dropsy, how much better results may reasonably be expected when clean cases are operated upon before the ascending ureteritis has set in. The only cases we can find in recent Australian literature where this method was adopted, are reported by Dr. Hamilton Russell, of Melbourne; (6) his three cases gave excellent results. Dr. Stewart McKay, of Sydney, (7) planned an ingenious operation on the old lines of closing in the bladder; he introduced a tube of rectal mucous membrane into the bladder to avoid the ureteral orifices coming into contact with fæces.

References.

(1) *British Medical Journal*, April 28, 1906.
(2) "*Exstrophia Vesicæ Urinariæ*," Jaromir Jelinek, of Brunn (Moravia), 1908.
(3) *Canadian Lancet*, 1899, XXXII., 23; *British Medical Journal*, June 22, 1901.
(4) *Surgery, Gynecology and Obstetrics*, February, 1901, p. 146.
(5) *Trans. Intercolonial Medical Congress of Australasia*, 1902.
(6) *The Medical Journal of Australia*, January 5, 1918.
(7) *Australasian Med. Gazette*, August 21, 1911.

Reviews.

CHEMICAL PRINCIPLES.

In his "Introduction to General Chemistry,"[1] Professor H. Copaux has supplied a brief summary of the general principles of the subject. In Chapters I. to III. he deals with the conservation of mass, the laws of chemical combination and the atomic theory. Chapter IV. is devoted to the general characters and inter-relations of the elements, radioactive transformations and the position of the radioactive elements in the periodic table being discussed at some length. Reference is also made to the existence of isotopes, a branch of the subject in which our knowledge has since been further advanced by the recent work of Aston. Chapters V. and VI. contain the usual discussion of the properties of solutions, chemical affinity, mass action, electromotive force and thermo-chemistry. Included in the volume are two appendices, one a note on the structure of crystals, the other a short article on hydrogen ion concentration, contributed by the translator, H. Leffmann.

Unfortunately, the book is not free from errors or misprints, whose occurrence in an elementary work is to be regretted. It is surprising that the author has represented the dissociation of a ternary electrolyte of the type RX_2 as $\overset{+\ -}{R}\ \overset{+\ +\ -}{X_2}$ producing R, X_2 and not R, 2X. On page 89 he states that "$MgCl_2$ is dissociated into three ions in very dilute solutions, $\overset{+\ -}{i.e.,\ Mg,\ Cl_2}$," and on page 93 "$H_2SO_4$ becomes $\overset{+}{H_2},\ \overset{-}{SO_4}$ and $Ca(OH)_2$ becomes $\overset{+}{Ca},\ \overset{-}{(OH)_2}$. Again, on page 85, $\frac{1-a}{1+a}$ should read $\frac{1-a}{1}$.

The treatment of the first four chapters is decidedly good, the subject being presented in a clear and interesting manner. Chapters V. and VI., however, are not all that could be desired. This must be the criticism of any work of the kind in which an endeavour is made to cover so much ground in so small a volume. Portions of these chapters appear to be beyond the scope of an introductory book, whilst others could be treated in greater detail with advantage.

[1] Introduction to General Chemistry: An Exposition of the Principles of Modern Chemistry, by H. Copaux; translated by Henry Leffmann, A.M., M.D.; 1920. Philadelphia: P. Blakiston's Son & Company; Pocket size, pp. 195, with 30 illustrations.

The Medical Journal of Australia.

SATURDAY, AUGUST 6, 1921.

Starvation and Disease.

A year ago the Right Honourable Arthur J. Balfour, as Chairman of the Council of the League of Nations, issued an appeal to the governments throughout the whole world for assistance in the endeavour to check the ghastly march of disease from Russia, across Poland to—God knows where. A year ago typhus fever was rampant, following in the wake of starvation. To-day the situation has become accentuated to an appalling extent and the unfortunate peasantry and other crushed elements of the Russian plebs, nurtured in crass ignorance and subdued by years of relentless tyranny, are gasping in the last throes of inanition, in despair of finding a crumb of bread or a drop of milk to infuse a particle of strength to work for the helpless, starving babies and their mothers. We learn that, as a last resort, countless hordes are about to move westward into central Europe.

Mr. Balfour pointed out a year ago that approximately two million pounds sterling were required to combat the typhus epidemic in Poland. This statement is a significant one. The prevention of a disease of which the ætiology is but imperfectly understood, is a matter of pounds, shillings and pence. No hygienist will question the truth of the claim that the epidemic can be checked. Mr. Balfour gives three reasons why the whole world should contribute to the campaign. The first is that the whole world has an interest in restoring the war-worn and plague-stricken areas of Poland and Galicia to a normal condition of well-being. The second is that, if the plague be allowed to spread unchecked from Russia to Poland, it will assuredly pass beyond the confines of the "buffer State." No European country, not even an island like Great Britain, would be safe if Poland were allowed to succumb. The third reason is the claim of humanity. To these three powerful arguments in support of the appeal for universal help we would add another, applicable particularly to the members of the medical profession. Our existence as a profession is based on the principle that accumulated knowledge shall be used for the treatment and prevention of disease. All our endeavours are directed toward alleviation of suffering and the stamping out of preventible diseases. It is not always possible for the individual practitioner to carry out an important function in the eradication of a devastating scourge, but a full appreciation of the extraordinary value of the opportunity must impel medical practitioners in Australia to make a contribution in money to enable those on the spot to carry out the work.

Typhus is not the only menace from Russia. It requires but little expert knowledge of epidemiology to recognize that when a community is underfed and its general resistance lowered, when clothing is scanty and difficult to procure and when the supply of soap and other material for cleansing purposes is exhausted, typhus, cholera, enteric fever, variola and other epidemic diseases will get out of control. Experience teaches, in addition, that syphilis becomes, under such conditions, a national scourge, widespread and immensely virulent. It is therefore not sufficient for the safety of the whole of Europe to attack typhus in Poland and Galicia. Relief must be extended to the starving and shivering people of central Europe generally, so that the main ætiological factor, common to these epidemics, may be removed. The International Council of Women have sent the ball rolling round the world to the several National Councils. This appeal is based almost entirely on sentimental grounds, the strongest moving force. Women and children are helpless, starving, dying! Hunger has placed its hideous mark on the gaunt frames of millions. It is a cry of despair feebly raised in Poland, but increasing in force as it is passed on by the charitable women in every land. In each State of Australia the National Council of Women has its organization, strongly administered by competent and large-hearted patriots. The medical profession in this wonderful country of ours is relatively prosperous. Its help is invited in the name of humanity.

THE REFLEXES IN INFANCY.

The diagnosis of nervous diseases and the localization of lesions of the nervous system is dependent on the exactness of physical examination. A more or less complete investigation of the circulatory, respiratory and digestive systems may be made with reasonable celerity, but an examination to detect abnormalities of the cerebro-spinal system requires much time, infinite patience and systematic care. Luckily the signs associated with a nervous lesion are in most instances easily recognizable, since they are seen and not heard. For this reason the physical evidences of nervous diseases are seldom matters of dispute, unlike the signs of pulmonary or cardiac involvement, which appeal to the more fallible sense of hearing. The superficial and deep reflexes are the foundation on which the diagnosis of nervous diseases is built. The abdominal, plantar and cremasteric among superficial reflexes and the knee, ankle, supinator and triceps jerks among deep reflexes are physical signs to which a definite significance has been attached. In the case of infants, however, the eliciting of these signs is fraught with some difficulty. A babe is almost in constant movement. Every stimulus of sound, light or motion attracts his attention and leads to ever-changing contractions of different groups of muscles. His aim would appear to be to thwart the scientific intentions of the examiner. Too frequently he shows his displeasure by crying and the general muscular rigidity which results, precludes any further examination. In spite of these difficulties, Dr. Charles W. Burr[1] has attempted the task of determining the nature of the chief reflexes in very young children. He examined 69 infants, all of them under 90 days of age. Twenty-seven were of negro birth and the remainder white. All were free from obvious nervous diseases, except one who had a congenital facial palsy.

Dr. Burr found that the plantar jerk was very variable. Gottfried Engstler showed many years ago that an extensor plantar reflex or Babinski phenomenon was frequently obtainable in infants during the first and second years of life and that it was to be regarded as normal. He attributed it to lack of development of the cortico-spinal tracts, though why the reflex in the first few weeks following birth should be extensor in some children and flexor in others has never been satisfactorily explained. Dr. Burr regarded as a plantar reflex only extension or flexion of the toes. In 19 cases there was no movement of the toes, even after vigorous stimulation. In 25 cases there was a definite extensor response and in 16 there was flexion. In nine instances the movements were erratic and indeterminate. One child, a boy, examined one hour after birth, showed marked extension of all the toes of the stimulated foot, with the curious fan-like spreading to which the French have given the description, *phénomène d'eventail*. Dr. Burr concludes that the most common form of plantar jerk is extension. Flexion is not uncommon and up to the third month or longer there may be no response.

The knee-jerk test was performed on 66 children and was present in all but five. These five were all less than four days old. In one white boy six days old the right knee-jerk was brisk; the left was not elicited. From this it is claimed that differences in the knee-jerk on the two sides in a child is not necessarily indicative of disease. The Achilles jerk was not obtained in 30 of 52 infants. Even when present it was usually not marked and only obtained after vigorous tapping of the *tendo calcaneus*. It has not yet been determined at what late period of life the Achilles jerk may make its appearance. Late to appear, it is in certain diseases one of the earliest to vanish. Tests for the abdominal jerk were made on thirty infants. In seven it could not be obtained. In four it was obtained only when the skin over the lowest third of the *rectus abdominis* muscle was stroked.

The results of these investigations show that little reliance can be placed upon the presence or absence of the reflexes in early infancy as evidence of disease of the nervous system. This is in contrast to the condition in adults, in whom an extensor plantar response or an absent knee-jerk has a definite pathological significance. At what precise age a child assumes full responsibility for the adult signs of nervous involvement has yet to be determined.

[1] *American Journal of Diseases of Children*, June, 1921.

RENAL DWARFISM.

Within recent years several English physicians have recorded the occurrence in children of interstitial nephritis, associated with stunted body development. The incidence of interstitial nephritis in children is rare and has not attracted general attention. In the condition to which Dr. Hugh Barber[1] has given the name renal dwarfism, the manifestations of nephritis appear insidiously and the patient usually comes first under observation for some skeletal deformity or general maldevelopment. Surgical treatment of the deformity frequently precipitates the onset of uræmia, when attention is at once directed to the associated renal disease.

As far back as 1883 Dr. Clement Lucas described "a form of late rickets marked by albuminuria," but he considered that the albuminuria was functional in nature and not related to any serious renal disease. An interval of 28 years elapsed before further attention was directed to this curious condition. Dr. Barber has published striking descriptions of ten cases. The history of a typical patient shows that he has been small from birth, but his condition has not caused any anxiety up to the time of commencement of his permanent dentition. As he grows older his body fails to develope and the smallness of stature becomes more obvious. The onset of *genu valgum* and of changes in the joints of a rachitic type urge the parents to seek treatment for the child. The arthritic changes are similar to those of late rickets—swellings at the costo-chondral articulations, irregular calcification and the appearance of zones of proliferation at the epiphyseal lines of the knee and wrist joints. Following the skeletal changes, and not infrequently preceding them, the patient manifests an abnormal thirst and polyuria. If care be taken to examine the urine, it will be found that it is pale in

[1] *Quarterly Journal of Medicine*, April, 1921.

colour, that its specific gravity is low, ranging frequently from 1.004 to 1.008, and that albumin is present. The cardio-vascular signs are equivocal and the blood pressure readings are not abnormal. The child is pasty-complexioned, but there is no definite anæmia. His intelligence is good. The primary and secondary sexual characteristics are frequently ill-developed, but may not be appreciably affected. The patient fails to live past the second decade, the termination of life being by uræmia or intercurrent disease.

The cause of renal dwarfism is not known. Dr. Barber's cases were equally distributed among girls and boys. There was no striking feature in the family histories and no child showed any sign of a congenital luetic infection. The occurrence of one or two dwarfs among a family of other healthy children receives no adequate explanation. At autopsy the kidneys have been found to be very small (one kidney of a boy of 15 years weighed only eight grammes), with a granular surface showing a few cysts and a narrow, pale, shrunken cortex. Microscopically, progressive changes in the interstitial tissue are a marked and invariable feature. The ductless glands and the brain have shown no unusual changes. Of the ten patients under review, only three are still alive; the others died of uræmia, which came on spontaneously or as a sequel to osteotomy for the cure of deformities.

The extraordinary relationship between the renal disease and the shortness of stature and bony deformities remains a mystery. Dr. Barber sees no explanation of the problem and he formulates no hypothesis. The condition, however, has not a few resemblances to *osteitis deformans* occurring in later life. In this disease skeletal changes are the marked feature and arterio-sclerosis, frequently associated with chronic nephritis, is a constant manifestation.

A LOST SPONGE.

An action at law which is of considerable interest to surgeons, is reported in the April issue of the *Canada Lancet*. Mr. and Mrs. Isaac Waldon, of Port Perry, near Toronto, Canada, sought to recover from Dr. Robert Archer, a local medical practitioner, $20,000 damages for alleged malpraxis. The evidence showed that on September 13, 1920, Dr. Archer advised that Mrs. Waldon undergo an abdominal operation. The advice was refused. On September 19 and again on September 25 Dr. Archer repeated his opinion that an operation was necessary. On the evening of the latter date Mrs. Waldon became much worse and Dr. Archer was urgently summoned. He requisitioned the services of his wife (an ex-nurse) and two other practitioners, one of whom was brought a distance of fifteen miles. An operation was performed in the patient's home and was completed in twenty minutes. Later, as the wound failed to heal satisfactorily, Dr. Archer suggested a laparotomy, thinking that he might have left a sponge in the abdomen at the time of the operation. Mr. and Mrs. Waldon refused. Some months later, after seeking the advice of other doctors, Mrs. Waldon allowed a Toronto surgeon to operate and the sponge was recovered.

Mr. Justice Sutherland, in giving a verdict for the defendant, with costs, remarked that the failure to remove the sponge could not be regarded as actionable negligence or as more than an "accidental, excusable and condonable slip or inadvertence resulting from the critical condition of the patient and the paramount duty of completing the operation in the shortest possible time."

AUSTRALASIAN MEDICAL PUBLISHING COMPANY, LIMITED.

Annual Meeting.

The annual general meeting of the members of the Australasian Medical Publishing Company, Limited, was held in the B.M.A. Library, 30-34 Elizabeth Street, Sydney, on July 19, 1921, Dr. W. H. Crago, the Chairman of Directors, in chair.

Directors' Report.

The Directors submit their report for the past year and balance sheet at June 30, 1921, together with profit and loss account for the twelve months ended June 30, 1921.

The Medical Journal of Australia has now completed its seventh year.

The large increase in the cost of production has caused the Directors much anxiety. Economies have been exercised, especially by reducing the size of the issues. This restriction, however, is undesirable and, moreover, is insufficient to remove the burden of high wages and other costs. The Directors are now purchasing paper at a lower price and anticipate some saving on this account during the ensuing year. The contract for printing has been terminated as from the end of September, 1921, and the type-setting and composing will be undertaken by the Company from that time onwards. In certain instances the advertising rates have been advanced. The Directors are hopeful that the financial difficulties may be lessened in the near future.

The Honourable A. J. H. Saw, M.L.A., and Dr. Gregory Sprott retire from the Board of Directors in accordance with the requirements of the Articles of Association, and are eligible and offer themselves for re-election.

W. H. CRAGO,
Chairman.

July 19 1921.

The Honourable A. J. Saw M.L.A., and Dr. Gregory Sprott were re-elected Directors of the Company.

WAR MEMORIAL FUND IN VICTORIA.

The following is a list of additional subscribers to the War Memorial Fund of the Victorian Branch of the British Medical Association: T. H. Boyd, W. R. Boyd, James Eadie, R. T. Fetherstonhaugh, S. E. Francis, Alan B. McCutcheon, R. R. Wettenhall. The total amount received now stands at £260.

In opening the State Parliament of Tasmania on July 26, 1921, His Excellency the Governor referred in the course of his speech to the *Mental Deficiency Act* passed last session, which will shortly come into force. Dr. E. Morris had recently visited America with the object of obtaining information which would be useful to the Government. A vast amount of work had been done in this connexion in America and far-reaching results had been achieved. A board of control would be constituted in due course to carry out the provisions of the Act in accordance with the most modern and up-to-date ideas. The regulations would be submitted to the House during the present session. Among the Bills to be introduced there is one for the constitution of a Government control of milk areas.

Abstracts from Current Medical Literature.

MEDICINE.

(60) Leukanæmia.

Douglas Symmers (*Journ. Amer. Med. Assoc.*, January 15, 1921) states that leukanæmia is probably not an independent disease, but one of a group of rapidly progressive derangements of the blood-forming tissues due to infection. The condition was described by Leube in 1900 as a rapidly progressive disorder characterized by changes that suggested a combination of pernicious anæmia and myelogenous leukæmia, the alterations in the peripheral blood being marked by severe anæmia, high colour index and the presence of excessive numbers of nucleated red cells and of large mononuclear cells, the latter belonging apparently to the myelocytic series. *Post mortem* investigation in cases of leukanæmia has yielded evidence of constant pathological changes, particularly a combination of red and white transformation of the bone marrow, myeloid foci in the liver and spleen and extensive infiltration and replacement of the lymph nodes by large mononuclear leucocytes similar to those found in the blood and bone marrow. Fatty changes also occur in the liver, heart and kidneys as well as petechial or gross hæmorrhages in the skin and in the mucous and serous membranes. In contra-distinction to pernicious anæmia there is an absence of siderosis of the liver. During life the number of leucocytes in the blood stream varies within wide limits; a hyper- or hypoleucocytosis may be present. Hence the actual number of white cells present is of little diagnostic value in many cases. The differential count invariably exhibits striking deviations from the normal, a high percentage of large mononuclear and non-granular white cells being constantly recorded, together with nucleated red cells, most of which are of megaloblastic type. Polymorphonuclear neutrophile leucocytes are relatively decreased in number and are in many instances characterized by the absence of granules in the cytoplasm. Eosinophilic and neutrophilic myelocytes may be found, but rarely constitute an important feature in the blood picture. Considerable discussion has centred round the identity of the large mononuclear non-granular white cells which are constantly found in the circulation, bone marrow, spleen, liver and lymph nodes. The fact that these cells give a positive oxydase reaction, and morphological considerations have added weight to the contention that these cells are in reality myeloblasts. It would appear that the provocative agent in leukanæmia brings about such widespread derangement of the hæmatogenic functions of the bone marrow that embryonal cells of both the erythroblastic and leucocytic series are simultaneously thrown into the blood stream. Leukanæmia is characterized clinically by an extremely rapid course and by changes in the blood, bone marrow, spleen, liver and lymph nodes that partake both of the nature of pernicious anæmia and myelogenous leukæmia, the causative agent acting on the bone marrow in such a way as to produce marked numerical increase in those primitive cells which represent the precursors of both the erythroblasts and the granular leucocytes.

(61) Broncho-Pulmonary Spirochætosis.

M. D. Levy (*New York Med. Journ.*, January 29, 1921) reports two cases of broncho-pulmonary spirochætosis due to infection by the *Spirochæta bronchialis* of Castellani. Since attention was drawn to this disease in Ceylon in 1905 and 1906 numerous cases have been reported from various parts of the world. Various investigators have confirmed Castellani's original observations, so that *Spirochæta bronchialis* is now generally accepted as a definite entity. Three clinical types of the disease are described, acute, subacute and chronic. The acute type is characterized by an initial chill and moderate pyrexia which persists for from two to eight days. Constitutional symptoms are comparatively mild, though the patient may complain of widespread rheumatic pains. The chronic broncho-spirochætosis is of greater clinical importance. This may follow an acute or subacute attack or may come on insidiously. The symptoms and signs are those of chronic bronchitis. Not infrequently the sputum may contain blood and frank hæmoptysis is not uncommon. Irregular fever may occur and the clinical picture closely simulate phthisis. The diagnosis depends on the microscopical examination of the sputum in which the spirochætes are readily stained with the ordinary aniline stains. The treatment recommended is the exhibition of the arsphenamine products intravenously. As cases of this disease have now been reported from various countries outside the tropics, the possibility of spirochætosis should be borne in mind in cases of chronic respiratory infection which give negative results on examination for tubercle bacilli.

(62) Latent Pulmonary Tuberculosis.

M. Solis Cohen (*New York Med. Journ.*, January 22, 1921) draws attention to the frequent existence of pulmonary tuberculosis in patients without symptoms definitely referable to the lungs. The term latent pulmonary tuberculosis is here applied in the sense of tuberculosis of the lungs in patients without respiratory symptoms, such as cough or expectoration. It is pointed out that patients belonging to this class are infrequently observed by medical officers of sanatoria, but are commonly present and frequently unrecognized in out-patient clinics and in general practice. That many other symptoms in addition to cough, hæmoptysis, expectoration, fever and night sweats may occur in patients suffering from pulmonary tuberculosis is a matter of common knowledge, though rarely is sufficient attention paid to this fact by clinicians. The author has attempted to analyse 75 cases in which the patients exhibited evidence of pulmonary consolidation without the presence of cough or of symptoms directly referable to the chest. The symptoms complained of have been grouped under seven headings: nervous symptoms, autonomic phenomena, gastro-intestinal disturbances, myalgia, menstrual and other pelvic disorders and general systemic disturbances, including general asthenia and cardiac disorders. Recognition of the diversity of symptoms which may be produced by tubercular disease of the lungs is a matter of very great importance, tending to emphasize the necessity of a comprehensive examination of the thoracic viscera in all patients, whether the symptoms complained of point to an affection of the respiratory system or to disturbances of function in tissues remote from the thorax.

(63) Juvenile Tabes.

C. Rosenheck (*Journ. Amer. Med. Assoc.*, February 26, 1921) discusses juvenile *tabes dorsalis* as a definite clinical entity. The extreme rarity of tabes in the young stands in striking contrast to the incidence of this disease in the adult. The early appearance of ocular symptoms has been a conspicuous feature in the majority of cases of juvenile tabes recorded in the literature. It is stated that many of the earlier observers confused juvenile tabes with Friedreich's ataxia. In the year 1910 the first necropsy record of a case of a child showing the characteristic pathological changes of *tabes dorsalis*, was reported by Malling, thereby establishing the existence of juvenile tabes on a pathological basis. Certain marked differences have been noted between tabes in the young and in the adult. The average age at which juvenile tabes manifests itself is placed at 15 years. The youngest recorded case occurred in an infant of three years. In general it is stated that the disease appears in youth approximately the same number of years after the primary infection as in the adult. Hereditary syphilis is responsible in the vast majority of cases. A study of the sex incidence indicates that nearly twice as many cases have been recorded in females as in males. This is a striking reversal of the incidence in adult life, in which the proportion is usually ten men to one woman. In 40% of youthful cases the onset has been marked by interference with vision, which has proceeded to total blindness. This resulted from optic atrophy. Bladder disturbances have appeared early in a considerable number of the recorded cases. Defects in gait were the first symptoms in a small number only, whereas lancinating pains marked the onset in 25%. Neither crises nor girdle pains have been observed at any time during the course of the affection in the young nor are trophic phenomena recorded. The same peculiar antagonism between the development

of ataxia and the ocular symptoms which has been universally observed in the adult type of the disease, appears to exist equally in the case of the juvenile tabetic. It has been aptly remarked that no symptom occurs in juvenile tabes which is not observed in the disease in the adult. As in the adult, the prognosis is excellent as regards life, but extremely bad in respect of vision.

NEUROLOGY.

(64) Nervous Involvement in Primary Syphilis.

U. J. Wile and C. K. Hasley (*Journ. Amer. Med. Assoc.*, January 1, 1921) report the results of investigations of the cerebro-spinal fluid in 221 cases of primary syphilis. In 22% of the cases definite deviations from normal were recognizable in the cerebro-spinal fluid. Wechselmann in 1912 drew attention to the involvement of the nervous system in the pre-roseolar period of syphilitic infection and came to the conclusion that in the primary stage of syphilis the lymph spaces of the nervous system may become the site of syphilitic infection and may cause deviation from normal in the cerebro-spinal fluid. The results obtained by this observer have since received adequate confirmation. In the series of 221 cases now reported by Wile and Hasley, in which a primary sore only was present, 106 failed to give a Wassermann reaction with blood serum. Lumbar puncture and systematic examination of the cerebro-spinal fluid was carried out in every case of the series. Deviations from the normal criteria were found in 60 instances. Of this number, in 11 there was merely an increase in cellular count; in the remaining 49 definite involvement of the nervous system could be properly assumed as evidenced by pleocytosis, increased solids and the Wassermann reaction. The colloidal gold test was unfortunately not carried out as a routine procedure. Clinical evidence of gross involvement of the nervous system recognizable by physical examination, was only recorded in a single instance in the whole series of cases. It is concluded that pre-roseolar involvement of the nervous system occurred with recognizable deviations from normal in the cerebro-spinal fluid in 49 out of the 221 cases examined. The involvement for the most part was regarded as of the nature of a transitory roseola of the meninges without necessarily resulting in permanent damage to the nervous system, since it was found that the cerebro-spinal fluid was rapidly restored to normal in the majority of cases by intensive anti-specific treatment. Positive findings in the cerebro-spinal fluid in a case in which the Wassermann reaction in the blood serum has not yet been obtained, must be regarded as indicative of generalization of the infection, the laboratory criteria of infection, as applied to the cerebro-spinal fluid, being of greater delicacy than examinations of the blood serum. These results parallel the previously reported findings with regard to generalization and dissemination of infection in rabbits.

(65) The Excito-Motor Syndrome of Epidemic Encephalitis.

Pierre Marie and Gabrielle Levy (*Revue Neurologique*, June, 1920) discuss the excito-motor syndrome of epidemic encephalitis (*encephalitis lethargica*) from the purely clinical standpoint and indicate a series of interesting manifestations which they illustrate by interesting cases. (1) Choreic movements. In one case there were rhythmic, choreic movements distributed generally, but not on the face, which came on three months after the initial febrile attack and were unattended by any objective sign of nervous lesion. In another case the movements are described as having been of the rhythmic, saluting form. (2) Bradykinetic movements. These are represented by slow, regular, rhythmic movements of great amplitude, affecting one extremity alone or sometimes the two extremities on one side. (3) Myoclonus. The authors merely mention this because it has been fully described by Sicard. (4) The Parkinsonian syndrome. Of this there are two forms, acute and progressive. In the acute form there is tremor (it may be of the whole body) and difficulty in walking, speaking and writing, as well as mental disturbances of a melancholic character. In the progressive form muscular rigidity is the dominant sign and tremor supervenes only with the execution of movements. (5) Tremor. This is simple in kind, rapid and fugacious, thus differing from the movements of Parkinson's disease and chorea. (6) Localized facial movements. These movements have been described by other writers. Here attention is drawn to one having a facio-linguo-masticatory localization. Finally, in regard to all these movements it must be mentioned that they arise at various stages of the disease, either in the opening illness or a week and even months later. The period of their duration also varies enormously. And in regard to diagnosis, in addition to the classical signs of lethargy, slight fever and oculo-motor trouble, which are not necessarily present, a number of other signs may be encountered, *viz.*, painful stiffness of the neck, trouble in chewing, facial spasm, increased salivation, lingual tremor, dysphagia, hiccough, a sense of suffocation and various muscle and tendon pains.

(66) The Syndrome of the Long Spinal Fibres (Combined Sclerosis).

Henri Claude and H. Schaeffer (*Revue Neurologique*, No. 9, 1920) describe a case of that uncommon condition, known to English writers under the name combined sclerosis, in which, contrary to what is usual, signs of grave anæmia were wanting. The patient, a female of 67 years, showed spastic paraplegia, with exaggeration of all tendon reflexes and a definite Babinski reaction. There was also loss or grave impairment of deep sensibility (muscle, joint and bone), but at the same time almost complete preservation of sensibility to touch, pain, heat and cold. In addition, there was ataxia affecting arms and legs alike. All these clinical manifestations had arisen within a period of fifteen months preceding death. Microscopic examination of the spinal cord showed sclerosis of the tracts of Goll and of the inner portion of the tracts of Burdach in the posterior columns; and of the crossed pyramidal tracts and to some extent the direct and antero-lateral cerebellar tracts in the lateral columns. Clinically and anatomically the case resembles previously published cases, but in the absence of anæmia the cause is obscure. In consideration of the woman's age, it is assumed that responsibility may be placed on some progressive organic degeneration comparable with anæmia. As she manifested no signs of anæmia the blood was not examined.

(67) The False Localizing Signs of Spinal Cord Tumour.

Charles A. Elsberg (*Arch. of Neurol. and Psychiat.*, Vol. V., No. 64) points out that in some cases of spinal cord tumour where the signs and symptoms at repeated examinations point to the localization of the tumour at a certain level, the growth may be found in quite a different position. He describes two examples of these "false localizing signs." The first occurred in a woman who presented distinct signs of an extra-medullary growth at the seventh thoracic segment; laminectomy involving the fifth to the ninth thoracic vertebræ, failed to reveal a tumour and the patient remained unrelieved. Three and a half years later she presented indications of a tumour at the seventh or eighth cervical segment. At the operation an endothelioma about 2.5 cm. long was removed from the posterior surface of the eighth cervical segment. In the second case operation failed to disclose an expected tumour at the eleventh thoracic segment. Seventeen months later an extra-medullary fibroma was removed from the fourth thoracic segment. Another fact which has impressed the author is the frequency with which tumours in the cervical region produce symptoms in the lower extremities only. He also points out that in rare instances a tumour on one side may so press the cord as to cause symptoms referable to the opposite side. For example, with indefinite Brown-Séquard symptoms, the greatest motor loss may be on the opposite side, and the greatest sensory disturbance on the same side as the tumour. Similarly, a growth on the anterior side may cause symptoms suggestive of a posterior growth. Lastly, in five cases of thoracic tumour of an expanding nature, Elsberg found tingling or hyperæsthesia in the fingers of one or both hands. Since in one of these much fluid under pressure escaped from above the tumour, he suggests that the finger disturbance was due to affection of the posterior roots by the column of fluid above the tumour.

British Medical Association News.

MEDICO-POLITICAL.

Meeting of the Federal Committee.

(Continued from page 91.)

The Federal Committee re-assembled at 9.30 a.m. on July 21, 1921.

The Federal Department of Health.

A letter was read from Dr. J. H. L. Cumpston, Director-General of Health for the Commonwealth, dated March 9, 1921, advising the Committee of the establishment of a Federal Department of Health, proposing that he keep in close touch with the Federal Committee in regard to matters of public health policy and offering to meet the Committee informally on the occasion of its bi-annual meetings for the purpose of discussing the policy of the Department and the actions taken by the Federal Committee in connexion with public health and preventive medicine. A reply to this letter had been sent to Dr. Cumpston on the authority of the Chairman and Dr. Cumpston had been invited to be present at the meeting. The Chairman's action was approved and Dr. Cumpston was introduced to the Committee.

Dr. Cumpston explained that it was the policy of the Federal Department of Health to keep in close touch with the medical profession as a whole. He had recognized at an early stage that the only method of carrying this policy into effect would be to approach the Federal Committee and to constitute a formal association with that Committee. The public health bureaucrats in the past had proceeded on wrong lines in the vain attempt to administer the public health laws without a collaboration of the medical profession. His Minister had recognized the importance of a frank exchange of ideas in order that the Department might gain the active support of the whole profession in regard to each item of its programme. Dr. Cumpston proceeded to sketch the avenues of activity which the Department proposed to open up immediately. He referred to the means to be adopted to keep Australia free of tropical or exotic diseases. Dr. Elkington had recently returned from a journey to Java, the Malay Peninsula and New Guinea, where he had availed himself of opportunities to investigate the measures employed in those parts for the control of the various tropical diseases. He dealt with some of the proposals concerning the extension of the machinery for keeping tropical diseases at bay. The second aspect of the tropical question with which his Department would concern itself, was that of the development of the tropical areas in the Commonwealth by a white population. The most urgent aspect of this question was that of the living conditions of white women in the tropics. In the next place, his Department proposed to take up the question of industrial hygiene. In this endeavour they would receive aid from three real experts whose services had been secured through the generous collaboration of the International Health Board of the Rockefeller Foundation. These experts would work with them for a period of two years and it was hoped that in the course of that time a solid foundation in industrial hygiene would be laid. It was proposed to investigate the health conditions of young women employed in industries and, in the second place, to further the organization of industrial welfare centres and clinics whose chief object would be the supervision of the health of the workers. He wished it to be understood that his Department had no intention of appointing a large and expensive staff to carry out this work. They would endeavour to encourage the great industrial firms to make their own arrangements with private doctors under the general guidance of the experts in his Department. In the last place, the programme included a more or less experimental item, namely, the establishment of extra-metropolitan laboratories for clinical research. At first it was proposed to place one of these laboratories in each State. This would enable them to ascertain the extent to which the country practitioners would take advantage of facilities for the laboratory aids to diagnosis. At these laboratories it was proposed that the necessary local public health work should be undertaken, that the work of clinical pathology should be carried out for the local practitioners and that facilities should be provided to enable general practitioners to conduct investigations themselves or to learn the technique of these investigations from expert workers. The Department would raise no objection if the State or municipal authorities wished to take over these experimental laboratories after it had been demonstrated that they were serving a useful purpose.

In turning to the manner in which the medical profession could assist his Department, he stated that hitherto the general medical practitioner had not concerned himself with questions connected with the prevention of disease. He suggested that in order that a workable scheme might be elaborated whereby the practising members of the profession would take an active interest in preventive medicine, each Branch of the British Medical Association in Australia should form a preventive medicine section or committee. Dr. Fetherston would be able to inform the Committee how the Preventive Medicine Section of the Victorian Branch had been started and how it worked. If the association between the section or committee and the Branch Council were a close one, it would be possible for the Branch to keep in touch with the departmental medical officer. Perhaps the Federal Committee would consider this matter and, if they approved, give the Branches a lead.

There was another matter that he would like to mention as a means of bringing the British Medical Association into contact with his Department. As they were all aware, legislation for the control of venereal disease had been introduced into all the Australian States. The first act had been passed in Western Australia five years before, while the Queensland, Victorian and Tasmanian acts were younger. In South Australia and New South Wales the machinery was in the course of construction. His Minister was of opinion that the time had arrived when some steps should be taken to ascertain the results of this legislation. It had been in operation for a sufficiently long time to enable them to form an opinion concerning its value. The Minister had decided to call together a conference of those best qualified to discuss this question. Such a discussion would be helpful in revealing the need for amendment, if such a need existed, and for guiding those charged with the administration in New South Wales and South Australia in regard to the best form of machinery. The conference would be held in Melbourne on September 5, 1921, immediately before the general meeting of the Public Health Association of Australasia. The Minister had determined to invite in addition to certain departmental officers and laboratory workers one delegate from each Branch of the British Medical Association. The critics of the *Venereal Diseases Acts* had spoken openly of their futility and of their inefficiency. Others claimed for them a high degree of usefulness and efficiency. Dr. Cumpston expressed the hope that the representatives of the British Medical Association would be present and take an active part in the determination of the questions at issue. He thanked the Committee for giving him an opportunity of placing before them a few ideas and for the kindly manner in which they had received him.

Dr. W. T. Hayward thanked Dr. Cumpston for having attended the meeting. He agreed cordially with him concerning the importance of a close co-operation between the Director-General of Health for the Commonwealth and the medical profession. The Committee were greatly indebted to Dr. Cumpston for his very interesting and able address. They recognized from the various proposals that Dr. Cumpston was in earnest in his determination to enlist the active assistance of the medical profession as a whole in his campaign to prevent disease.

Dr. Newland was glad that Dr. Cumpston had asked them to consider the advisability of inducing each Branch to establish a section of preventive medicine. In his opinion a section would be a better instrument than a committee for this purpose. He reminded the Committee of the proposal brought forward at the Brisbane Congress to ask the Branches to establish sections of surgery. There was at present a tendency to establish independent bodies to deal with special branches of medicine and surgery. The Federal Committee should consider the whole question of the organization of sections of the Branches. In reply to a remark by Dr. Lockhart Gibson concerning the danger that

members of one section might abstain from attending the meetings of the Branch or of other sections, Dr. Newland stated that the holding of joint meetings would be found effective.

Dr. R. H. J. Fetherston said that there were in Melbourne four societies practically unattached or only loosely attached to the Victorian Branch. The Section of Preventive Medicine, however, was a part of the Branch. The Section had its own office-bearers and made its own arrangements in regard to meetings. But every member of the Branch received the notices of the meetings, which were included in the notice paper of the Branch meetings. He strongly disapproved of outside medical societies which tended to weaken the usefulness of the British Medical Association.

Dr. J. A. Dick asked Dr. Cumpston whether there appeared to be any prospect that the Federal authority would take over from the States the registration of medical practitioners. The Federal Committee had desired a Federal medical act for the whole Commonwealth, but understood that the sovereign rights were vested in the State parliaments.

Dr. Cumpston said that it would depend whether the State Governments would surrender their sovereign rights to the Federal Government.

Dr. W. N. Robertson pointed out that the establishment of laboratories was urgently needed as a protection against diseases menacing Australia from the east. He asked whether it was intended to place a laboratory in Cairns. He held that a strong laboratory should be placed at the gateway.

Dr. Cumpston explained that the Federal Department of Health was hampered by the fact that economy had to be exercised. He would like to establish well-equipped laboratories at Port Darwin, Thursday Island, Cairns, Townsville, Rockhampton and Brisbane, as well as at Broome. He regretted that the money at the disposal of the Department would not suffice to do this. There was a need for more than the establishment of laboratories at the quarantine ports. At present if a case of dangerous infectious disease passed the quarantine barrier, his Department had no power to institute measures to check the spread of the infection. All they could do was to report the matter to the Public Health Department of the State concerned. In some instances the Public Health Department relied on the local authority to take the necessary steps, while the local authority did nothing, because it regarded the matter as the concern of the Health Department.

Dr. David Thomas thought that diagnosis laboratories should be provided in every district throughout the States. It did not matter whether the State or the Federal Health Department undertook the responsibility for the establishment.

Dr. W. T. Hayward suggested that the Federal Committee should refer to the Branches the question of the advisability of the taking over by the Federal Health Department of the complete control of public health from the States.

Dr. Newland asked Dr. Cumpston whether he was prepared with any scheme for the unification of the public health administration.

Dr. Cumpston pointed out that such a change would involve an alteration of the Australian constitution. After various other matters had been discussed, Dr. Cumpston withdrew, the Chairman expressing to him the thanks of the Committee for his attedance and advice.

Re-Organization of the Australian Army Medical Services.

The Honorary Secretary submitted a letter from the Secretary of the Minister for Defence, dated April 18, 1921, covering a copy of the report of the Committee appointed to advise upon the re-organization of the Australian Army Medical Services. It was stated in the letter that no regulations had been promulgated as a result of the report of the committee. He also submitted a report of a deputation from the Federal Committee to the Minister for Defence on May 18, 1921 (see *The Medical Journal of Australia*, June 25, 1921, page 520). A report had been drawn up by a sub-committee of the Federal Committee, consisting of Mr. G. A. Syme, Dr. R. H. J. Fetherston and Dr. J. A. Dick, on the recommendations contained in the commitee's report.

Dr. J. A. Dick moved and Dr. Thomas seconded that the sub-committee's report be received.

A discussion ensued on many aspects of the report. It was pointed out that the remuneration of area medical officers had been increased from £60 to £85 *per annum*, but that the size of the areas had been materially enlarged in all parts of the Commonwealth. In some instances the medical officer had little to do, while in others he had very onerous duties. The sub-committee had considered this matter and had arrived at the conclusion that area medical officers should be paid for work actually performed and not by salary. A scheme was contained in the report including a scale of fees which had been drawn up after careful consideration of the attendant circumstances. The scheme obtained the approval of every member of the Committee.

The question of the age for compulsory retirement of medical officers of the Australian Army Medical Corps was discussed in connexion with the recommendations concerning the seniority of officers. It was pointed out that the age for retirement had recently been altered to correspond with the regulations of the Australian Military Forces. It was determined that a request be addressed to the Director-General of Medical Services to re-consider the question of the ages at which medical officers of various ranks would be required to retire from the service.

Some discussion also took place in regard to advisability of the recognition of peace-time service as well as war service abroad and at home in the determination of seniority. The members of the Committee accepted the recommendation of the sub-committee, but exhibited a disinclination to embarrass the Director-General of Medical Services. The Committee recognized that as the sub-committee's report had been submitted to the Department of Defence, the views expressed therein would receive official attention. On the motion of Dr. Dick, seconded by Dr. Thomas, the sub-committee's report was adopted.

Dr. Dick, on behalf of the New South Wales Branch, moved:

> That the medical services of the Navy, the Army and the Air Forces be under a Director-General of Medical Services, responsible to the Minister for Defence; that the staff of the Director-General include a Director of Naval Medical Services with naval rank, a Director of Military Medical Services with military rank and a Director of Air Medical Services with air force rank; and that, associated with these officers, there be a consulting physician, a consulting surgeon, a medical officer of hygiene, a medical officer of research and a senior dental officer; and that the Board thus constituted be empowered to invite the assistance when required of the Matron-in-Chief.

Dr. Dick explained that the motion was perhaps too detailed for consideration by the Committee. He was anxious to obtain their approval of the principle. The New South Wales Branch Council has considered the proposal for the establishment of one medical service to supply the needs of the Navy, the Army and the Air Forces and had co-opted several medical officers of high standing in the Naval Medical Services and in the Army Medical Corps. It was pointed out that the permanent establishment of a Naval Medical Service of twenty-six officers appeared to be extravagant unless some co-operation between them and the Army Medical Corps were instituted. The training was essentially the same for all three classes of officers. On the ground of economy it was urged that a scheme for making the services of medical officers available for all three limbs of the Defence Forces under one responsible head would effect a very considerable saving. Moreover, Dr. Dick pointed out, with the organization of one medical service there would be a great gain in efficiency. The present wasteful system would be replaced by one in which every officer would be profitably employed to the benefit of the whole service and of themselves. The Branch Council and the co-opted members had arrived at the conclusion that the present time was opportune for pressing for this reform, since the matter of the re-organization of the Australian Army Medical Service was under consideration. The proposals were regarded as practicable, advisable and reasonable by the experts of the Naval Medical Service. He thought that it would be wiser to simplify the motion and

consequently begged leave to amend the motion as follows:

> That there be one medical service to provide the medical needs of the Navy, the Army and the Air Forces under one Director-General of Medical Services responsible to a Minister.

Dr. H. S. Newland seconded the motion. He recognized that the proposals stood for increased efficiency and for economy and he was prepared to endorse the principle.

Mr. G. A. Syme said that the original motion of the New South Wales Branch had appeared to him to be confused. The Victorian Branch regarded the scheme impracticable in that form. He was much impressed by the clear explanation given by Dr. Dick and would favour the general principle involved in the amended motion. He felt, however, that the instructions received from the Victorian Branch would prevent him from voting for the motion.

In the course of the discussion that followed, the suggestion was made that the scheme might be enlarged to include civil medical services. Dr. Dick asked the Committee to restrict the question to the main principle of advocating one medical service. Eventually an amendment was moved to refer the question back to the Branches for further consideration in the light of Dr. Dick's explanation. This course was adopted.

Dr. Dick then moved on behalf of the New South Wales Branch:

> That the *Defence Act*, 1903, 1920, Part III., Section 125 (*c*) (*d*), Section 126 (3) and Section 127, be amended to provide that during the fourth and fifth years every male medical student shall serve in the Defence Medical Service.

He explained that this motion was a continuation of the previous motion. It was felt that full success in the reconstitution of the medical services could not be attained unless the service were made attractive and unless some means were devised to make medical men familiar with the attractions of the service. The proposal in effect was to require medical students during the first three years of their course to undergo training in the usual manner in the Citizens' Forces. Many of them joined the University Scouts or the University Rifles. When they reached their fourth year, they should be required to serve until graduation in the Army Medical Corps in a non-commissioned capacity. University ambulances could be established to render it possible for the students to undergo this training. On graduation they would be eligible for a commission in the Army Medical Corps as second lieutenants. In this way the medical services would benefit by a continuous supply of young and capable orderlies and officers. The graduates, having become familiar with the working of the service, would, in many instances, be tempted to retain their commissions and to work their way up to higher rank. He mentioned that the Western Australian Branch had submitted a motion dealing with the same subject. In discussing his own motion, he called attention to the fact that the recommendation of the Departmental committee of which General Sir Neville Howse had been a member, practically coincided with the proposals contained in the motion.

Dr. W. T. Hayward thought that it might be preferable to exempt the medical student during his fourth and fifth years from infantry drill, but to require him to attend lectures and classes on military medicine and surgery. The time spent on these lectures and classes would count in his compulsory training. After graduation, he might enter the Army Medical Corps with a commission.

Dr. Fetherston said that the Victorian Branch did not approve of the motion. He pointed out that Dr. Dick's proposals were practically in operation at the present time. The Victorian Branch favoured a total exemption from infantry training of medical students during the fourth and fifth years. He thought that if they were enlisted in the Army Medical Corps during the later part of the course, they would certainly seek commissions on graduation. In the event of war, the corps would be depleted of trained bearers and orderlies. He did not think that University ambulances could be established without difficulty. In the absence of an ambulance at the University, the student would be compelled to sacrifice a part of his vacation for the purpose. He feared that the plan would result in the breaking up of the University corps.

Mr. G. A. Syme stated that at Melbourne the lectures on military medicine and surgery had been discontinued. These lectures had been given to students in their fifth year. He recognized that while there was difference of opinion as to the way in which the regulations should be altered, they all desired to secure training in the Army Medical Corps for medical graduates. The Western Australian Branch motion very nearly expressed the wishes of the Victorian Branch.

After further exchange of opinion had taken place, Dr. Dick withdrew his motion in favour of another to the following effect:

> That during the fourth and fifth years male medical students may be exempted from military service in the Citizen Forces, provided they undertake to complete their service in the Australian Army Medical Corps after graduation and provided they remain in Australia.

The motion was carried.

Dr. J. A. Dick moved and Dr. D. Thomas seconded:

> That garrison hospitals should be maintained for the treatment of the permanent defence forces and the training of the personnel of the medical, dental and nursing services.

He informed the Committee that formerly this treatment and training had been carried out in the Garrison Hospital at the Victoria Barracks, Sydney. Within recent times the hospital had been closed for this purpose. He claimed that the closure of the Garrison Hospital was not in the interests of the medical service.

Dr. R. H. J. Fetherston stated that there was no garrison hospital in Victoria. The treatment of the soldiers in the defence forces and the training of the personnel of the medical, dental and nursing services were carried out in the public hospitals. In New South Wales some arrangement of this kind would have to be made, if the Garrison Hospital remained closed. They should remember that there were no longer any military hospitals.

Mr. Syme pointed out that before any action were taken in this connexion, it would be advisable to ascertain from the Director-General of Medical Services what he proposed to do. They must assume that General Sir Neville Howse was aware of the facts and would, if he thought it necessary, take suitable steps to provide for the special treatment and training. The motion, on being put to the meeting, was lost.

Date of Next Meeting.

It was resolved that the next meeting be held in Melbourne in February, 1922. The suggestion was made that the Chairman should endeavour to arrange the date to suit the convenience of members wishing to attend the annual meeting of the New Zealand Branch of the British Medical Association from February 27 to March 3, 1922.

Votes of Thanks.

Hearty votes of thanks were passed to the Council of the New South Wales Branch for their kind hospitality, to the New South Wales Branch for accommodating the Federal Committee during their meetings and to the Chairman for his able conduct of the meetings.

Owing to the small amount of space available, the publication of a summarized report of the discussion on Dr. J. F. Wilkinson's excellent paper on the significance of the absence of hydrochloric acid in the gastric secretion has been unavoidably postponed.

The undermentioned have been elected as members of the New South Wales Branch:

Miss Constance Brodribb Slater, M.B., 1903 (Univ. Lond.), St. James's Rectory, Croydon.

F. A. E. Lawes, Esq., M.B., Ch.M., 1921 (Univ. Sydney), Royal Prince Alfred Hospital, Camperdown.

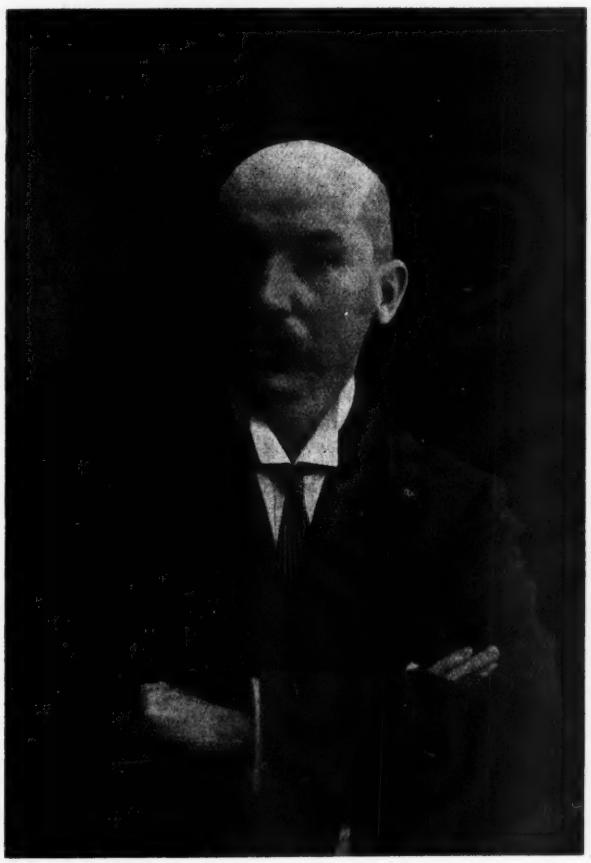
H. H. Skeoch, Esq., M.B., Ch.M., 1918 (Univ. Sydney), Audley Street, Petersham.

David William Hawke, Esq., M.B. (1921, Univ. Sydney), of Boronia Avenue, Burwood, near Sydney, has been nominated for election as a member of the New South Wales Branch.

Obituary.

BENJAMIN POULTON.

A life well spent, full of promise in its early days, rich in achievement as the years have passed, closed the other day in Adelaide. As he approached the time when the normal span of life is supposed to have been reached, Benjamin Poulton must have experienced the satisfaction given to but few of having won the esteem, high approval and affection of his compeers. He must have felt that the long years of ceaseless struggle to benefit his profession and suffering humanity had borne good fruit and that he had gained a prize which is never a vain one—popularity among his colleagues. His friends and contemporaries will miss the genial personality and will find it difficult to forget the kind friend, the honourable comrade, the reliable counsellor. But his influence will persist and the younger generation and that which will follow, will benefit because Benjamin Poulton lived and used his life to good account.



He was born in Geelong, Victoria. His schooling was conducted first at the Flinders School, Geelong, and later at Scotch College, in Melbourne. In due course he entered the University of Melbourne for the purpose of studying medicine. He graduated as a Bachelor of Medicine in 1874. He spent a short time in Queensland after graduation. In 1879 he took a surgical degree at Melbourne. After leaving Queensland he went to London and again became a medical student, both at Saint Thomas's and at Saint Bartholomew's Hospitals. In 1880 he took the membership of the Royal College of Surgeons of England. On his return to Australia in 1882, he was appointed junior house surgeon at the Adelaide Hospital. Three years later he became senior house surgeon and two years later still he was appointed Honorary Assistant Surgeon. In 1884 he took his degree of Doctor of Medicine at Melbourne and in the same year he was admitted to the Adelaide University as Doctor of Medicine, *ad eundem gradum*. One year's service as Assistant Surgeon at the Adelaide Hospital sufficed to establish his position very firmly, for in the following year, when a vacancy occurred, he was appointed full Honorary Surgeon, a position that he held until 1920.

Benjamin Poulton was elected a member of the British Medical Association in October, 1882. In 1883 he read a paper before the South Australian Branch on compound fractures of the lower extremity. Since that time he has read numerous papers before the Branch on a large variety of subjects. In 1886 he was one of the prime movers for the establishment of a congress in Australia. The idea soon received approval from the members of all the Branches of the British Medical Association in Australasia and, as a result, the first Intercolonial Medical Congress was held in Adelaide in 1887. Benjamin Poulton was asked to take on the onerous and responsible duties of Secretary, duties which were especially difficult on that occasion, because no precedent existed to guide him. In *The Medical Journal of Australia*, of August 14, 1920, an article was published on the history of the Congress. Under the caption, "The Idea and Its Application," it is stated that in the report of the Executive Committee of the first Congress, no mention was "made of one very important fact, namely, that the idea of an intercolonial medical congress was Dr. Ben. Poulton's." How well he developed his idea may be gathered from the fact that at the second session at Melbourne, the President, Mr. T. N. Fitzgerald, presented Benjamin Poulton, in the name of the Congress, with "an inkstand appropriately inscribed, in place of the one he had worn out in the service of the Committee," and a purse of sovereigns as a token of appreciation of his services.

In the year following the Congress, his South Australian colleagues, recognizing that Benjamin Poulton was prepared to perform sterling service for the benefit of his profession without thought of pecuniary gain, asked him to accept the position of Honorary Secretary of the Branch. He held this position for four years. As early in his career as 1883 he was elected a Fellow of the Royal Society of South Australia. It will be noted that throughout his professional life he succeeded in associating his scientific work with the holding of honorary positions in which his technical attainments proved especially valuable. In 1890 he was appointed Lecturer on the Principles and Practice of Surgery at the University. The students were privileged to learn from him for a period of thirty years. He was a good teacher and a popular lecturer. Even those who hold that the systematic lecture is an ineffective and clumsy instrument for teaching science, will admit that Benjamin Poulton contrived to render his lectures of very considerable value to his students. In 1892, his popularity and his knowledge of men and of his profession again manifested themselves. The deanship of the Faculty of Medicine became vacant and Poulton was selected to fill it. The school had the advantage of his guidance for only two years.

In 1905 the Congress, which had changed its name to the Australasian Medical Congress, came again to Adelaide. The choice of Secretary again fell on Benjamin Poulton and again he threw all his energies into the work, achieving unqualified success. On this occasion he was associated with Dr. W. T. Hayward. Four years later, his colleagues in the South Australian Branch of the British Medical Association showed him a further sign of confidence and appreciation by electing him to be their President. This position of honour was again offered to him in the year 1912. In 1916 he was made a Trustee of the South Australian Medical Benevolent Association, of which he had been a member since 1887. On taking his seat on the Board of Trustees, he was immediately elected to the chair. He held this position for four years. In 1899 he was appointed a member of the Council of the University of Adelaide and in 1916 he was chosen as representative of the University on the Board of

Management of the Adelaide Hospital. In 1920 he retired from nearly all his profesisonal offices.

Outside his profession he held several important positions and in his hobbies, as in his work, he manifested an unusual thoroughness and determination to excel. He was noted as an accurate and keen observer and he possessed the ability of awakening in others the desire to look for proof in connexion with every chapter of professional work.

He is survived by a widow and three daughters, who are receiving innumerable assurances of sympathy.

At the commencement of the meeting of the South Australian Branch of the British Medical Association on July 28, 1921, the President, Dr. Bronte Smeaton, moved the adjournment of the meeting. He said:

"Dr. Poulton has long been one of the standards by which we measure our ethics and abilities; how many of us have failed to reach his level? No better record of worth and achievement could be shown. Twenty-five years ago, five or six Adelaide graduates working in London agreed that Dr. Poulton's surgical work shone in comparison with that of the London surgeons. Riper experience of later years has confirmed the opinion that he was a surgeon of judgement and ability. His sheer determination to do the very best for his patient, whatever the difficulties, gave him results denied to many. The death of such a surgeon must surely be deplored by the community.

"At a very modest estimate, he has performed at the Adelaide Hospital upwards of 10,000 operations and has given the people countless other services. His influence as lecturer and clinical teacher for thirty years cannot be measured.

"The greater number of our members will gratefully admit a debt that can never be repaid.

"During the war none did more than he for the members of the Australian Imperial Force at Keswick. He found time, also, in those days of endless work to write frequently to almost every member of the Australian Army Medical Corps from South Australia who had gone abroad.

"We all remember his work in the Council and in the Chair of the Branch, in the Faculty of Medicine and the Council of the University and on the Hospital Board. Some such services might be recounted of many and such positions will be taken by others; but the place he had in the hearts of his friends can never be filled. His quick appreciation of the right and denunciation of wrong, his impetuous praise and blame sprang from a spirit of rare honesty and fearlessness. He had not the unlovely faults that mar so many natures—no hypocrisy, no bragging, no compromise with evil. He was honest and kind, with a quick, delicate sympathy that has comforted so many. There was—and there can be—only one Benjamin Poulton—and he is gone."

The President's words were supported in sympathetic terms by Dr. H. Swift and the members then paid their last formal mark of respect to their dead colleague.

Medical Appointments.

IMPORTANT NOTICE.

Medical practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, 429 Strand, London, W.C..

Branch.	APPOINTMENTS.
QUEENSLAND. (Hon. Sec., B.M.A. Building, Adelaide Street, Brisbane.)	Australian Natives' Association. Brisbane United Friendly Society Institute. Stannary Hills Hospital.
VICTORIA. (Hon. Sec., Medical Society Hall, East Melbourne.)	All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Manchester Unity Independent Order of Oddfellows. Mutual National Provident Club. National Provident Association.
NEW SOUTH WALES. (Hon. Sec., 30-34 Elizabeth Street, Sydney.)	Australian Natives' Association. Ashfield and District Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham Dispensary. Manchester Unity Oddfellows' Medical Institute, Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. North Sydney United Friendly Societies. People's Prudential Benefit Society. Phœnix Mutual Provident Society.
SOUTH AUSTRALIA. (Hon. Sec., 3 North Terrace, Adelaide.)	Contract Practice Appointments at Renmark. Contract Practice Appointments in South Australia.
WESTERN AUSTRALIA. (Hon. Sec., 6 Bank of New South Wales Chambers, St. George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND: WELLINGTON DIVISION. (Hon. Sec., Wellington.)	Friendly Society Lodges, Wellington, New Zealand.

Diary for the Month.

Aug. 9.—Tas. Branch, B.M.A..
Aug. 9.—N.S.W. Branch, B.M.A., Ethics Committee.
Aug. 10.—Melb. Pædiatric Society (Vic.).
Aug. 11.—Vic. Branch, B.M.A., Council.
Aug. 11.—Brisbane Hospital Clinical Society.
Aug. 12.—N.S.W. Branch, Clinical.
Aug. 12.—Q. Branch, B.M.A., Council.
Aug. 12.—S. Aust. Branch, B.M.A., Council.
Aug. 16.—N.S.W. Branch, B.M.A.: Executive and Finance Committee.
Aug. 16.—Illawarra Suburbs Med. Assoc. (B.M.A.).
Aug. 17.—W. Aust. Branch, B.M.A..
Aug. 19.—Eastern Suburbs Med. Assoc. (N.S.W.).
Aug. 19.—North Eastern Med. Assoc. (N.S.W.).
Aug. 23.—N.S.W. Branch, B.M.A.: Medical Politics Committee: Organization and Science Committee.
Aug. 25.—S. Aust. Branch, B.M.A..

EDITORIAL NOTICES.

Manuscripts forwarded to the office of this journal cannot under any circumstances be returned.

Original articles forwarded for publication are understood to be offered to *The Medical Journal of Australia* alone, unless the contrary be stated.

All communications should be addressed to "The Editor," *The Medical Journal of Australia*, B.M.A. Building, 30-34 Elizabeth Street, Sydney. (Telephone: B. 4635.)